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ABSTRACT

This study illustrates the underlying premise that certain classes of participants may be adversely affected by organizational experiences in ways that are not normally recognized. Schools belong to a set of organizations whose primary function is to socialize organizational members. This function is described as the providing of a process to a recipient class, and structures utilized for this function are termed process events. Process accounting entails the arrangement of career data on individual recipient class members into longitudinal data files and the typological analysis of this information relative to output measures which bear on the socializing goals of the organization. Process accounting is interpreted as a sociological model of school accountability because it illuminates the impact of group structures on different student subgroups. The case study focuses on the impact of a high school's ability grouping and letter grading practices on 9th grade black students differing in social status. Study findings indicate that students of low status situated in academically competive English classes manifest considerably lower output measure profiles than do their peers. Several explanatory theses are considered. (Author)

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PROCESS ACCOUNTING: AN EXAMINATION OF SOME EFFECTS OF STUDENT GROUPING AND GRADING PRACTICES IN A METROPOLITAN AREA HIGH SCHOOL

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PREFACE

This report describes a methodological schema for assessing the effects of organizational structures on participants in certain kinds of organizations. When a school administrator considers the merits of "open" classrooms, when he weighs the virtues of pass-fail versus letter grades, when he evaluates modular scheduling, in each of these instances he is seeking to determine the effects of organizational structures on students. Similarly, when the educator examines the internal dynamics of these various structures, he is focusing on the process of education. The sociological notions of process and structure which underlie this study sweep across the spectrum of educational practices and I believe they give a useful order to these.

Because this is a sociological monograph--an academic dissertation--as well as a report of educational research, readers may wish to search this document differently depending upon their own interests. The discussions of social theory in Chapter Two and formal methodology in Chapter Three may be of greatest interest to researchers. On the other hand, Chapters One, Six, and Seven deal with issues that are central to the educator's role. These chapters point up the influences of structural arrangements on students and they suggest ways in which the educator may intervene to make these influences consistent with policy objectives.

Many people have contributed to the successful completion of this study. Deserving of first mention are the project personnel of the United States Office of Education which funded this research (OEG-2-710087, Project # 1-B-087). This study continues a line of research that was initiated in 1969 by Dr. David E. Wilder under a grant from the Program for Situational Analyses, which was a component of the Program for Educational Leadership of the Department of Educational Administration at Teachers College, Columbia University. The Program for Situational Analyses was also funded by a U.S.O.E. grant (OEG-0-8-081936-4277 (072)).

Over the course of four years many individuals of high quality have assisted this research. In singling out several for mention here, I am taking into account the extensiveness of their contribution. Susan Kosoff served as field work supervisor with competence and esprit. The Calculogic Corporation of New York City provided technical expertise of a high order in the processing of computerized data. Special thanks are due France Burke for her most able stewardship of the project's funds and Jean Hanson who responded heroically and produced this finely typed manuscript. The contributions of the officials of the "Transurbia" school system for cooperating freely with this research are also gratefully acknowledged.

This document has benefited from the valuable insights and suggestions of Professors Sloan R. Wayland, Allen H. Barton, Peter M. Blau,

and Robert A. Dentler. Mr. Walter Furman also contributed several useful suggestions. The course of exploratory and basic research requires leadership that is trusting and sure. I gratefully acknowledge the patience and understanding of my supervisors at Biometrics Research, New York State Department of Mental Hygiene--Dr. Joseph Zubin, Chief of Biometrics Research and Dr. Ruth Bennett, Head of the Gerontological Section of Biometrics Research.

Barbara Blumner participated actively in this research at many stages: as data collector, coder, interviewer, editorial assistant, and throughout she has been my strength and my encouragement.

Finally and most especially, I would like to express my appreciation and enormous gratitude to Professor David E. Wilder of Biometrics Research and Teachers College. For four years he has shared with me the excitement of discovery in data analysis. This study makes use of a sociological theory termed reference group theory, a common language derivative of which is the expression that man teaches best by the example he sets. I consider myself unusually fortunate to have been tutored these last four years in intellectual honesty and human decency.

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CHAPTER I

ACCOUNTING HUMAN CHANGE IN ORGANIZATIONS

> It is true, as psychoanalysts continually point out, that people do often have "the increasing sense of being moved by obscure forces within themselves which they are unable to define." But it is not true, as Ernest Jones asserted, that "man's chief enemy and danger is his own unruly nature and the dark forces pent up within him." On the contrary: "Man's chief danger" today lies in the unruly forces of contemporary society itself, with its alienating methods of production, its enveloping techniques of political domination, its international anarchy--in a word, its pervasive transformations of the very "nature" of man and the conditions and aims of his life.
>
> (C. Wright Mills, The Sociological Imagination)

What are the forces that shape man's "nature" in the modern world? Few educated people believe today that man's psyche is the inevitable result of his genetic inheritance. A psychological component of human development is readily accepted. The ancient controversy of nature versus nurture has given way to an almost universal conciliation that both forces are strong determiners of the human persona.

But old Weltanschauung tend to reassert themselves and this clearly has occurred in the area of man's naive notions of his own development. Though the immobile vision of man as the inexorable fulfillment of his physiological grain has been discarded, an equally fatalistic vision has come to replace it. Promethian man emerges now from the forge of a family life in which his psyche is fused at an early age. Psychological man is scarcely

less predestined than his physiological forerunner. He is the product of nature and nurture alike but likewise he is a product and that means that he is a static entity which somehow experiences but is not transformed by experience. Man is conceded a formative, psychological period from which he steps into a character that is frozen.

This vision of man has a lot to do with the nature of our institutional life and especially with bureaucratic life. It says that man is rationally adaptive within the limits of his fixed psyche. Saying this immediately exonerates institutions from the possible moral burden of altering psyches. It interprets all interactions between man and organizations in which they participate as transactions. Nowhere can this point be seen more clearly and completely than in our public schools. Students enter schools with certain potentials to acquire knowledge and ways of dealing with peers. The extent to which students approximate their full cognitive and social potentials is said to reflect either their family situation or their motivated rational desires. For example, it is said of the "underachiever" that he is not "trying" hard enough or that he is bothered by problems "at home." Neither explanation allows for the possibility that the student's lack of motivation may itself stem from the kind of school experience that he is provided. The mythology of man's fixed nature helps to discount situational elements by positing the existence of free choice, conditioned only by man's psychological disposition to prefer certain alternatives.

This mythology protects many organizations from the need to assess carefully their own structured ways of treating people. It does this by

placing the onus of failure on the individual and on his family. It is scarcely surprising then to find a varied array of ancillary "therapeutic" services to treat individual and family failures. They are condiments of a psychological era. Their existence is further certification of the blamelessness of institutions such as schools.

The above description overstates the extent to which institutions are free from sharp, critical scrutiny. In recent years, a field called program evaluation has developed which seeks, in part, to specify ways in which institutions themselves fail or succeed. This dissertation applies sociological and program evaluation methods to the analysis of a high school's grouping and grading practices.[1] The particular school's practices are not unusual: their analogs probably could be found in most comprehensive public high schools in America. The central importance of this study is the systematic presentation of a method for looking at schools. This method focuses primary attention on organizational structures--on the ways in which they affect

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[1] This study has several antecedents which should be mentioned here. David E. Wilder's study of student grouping practices in Plainfield, New Jersey provided the model for organizing school records in order to examine grouping practices. See William P. Anderson (dir.), Grouping Students for Instruction in the Plainfield, New Jersey School System (New York: Institute of Field Studies, Teachers College, Columbia University, 1969), pp. 31-102. Wilder's subsequent work in "Transurbia," in which this writer assisted, further developed this model. The data base used in the present study is an enlarged version of the data file developed in connection with the Transurbia work. For reports of this work, see David E. Wilder and Alan S. Blumner, "Student Allocation Decisions: An Analysis of Different Grouping Procedures and Consequences" (New York: Paper presented at the American Educational Research Association Annual Meeting, February, 1971), and David E. Wilder and Alan S. Blumner, Some Sociological Aspects of Student Allocation in Two Racially Mixed Suburban High Schools (New York: Program for Situational Analyses, Teachers College, Columbia University, 1972).

students' motivations and aims. The novelty of this method is that it starts from the premise that in their ordinary, nonexperimental functioning, organizations like schools often transform the nature of their clients in unwanted and unrealized ways. This method goes beyond most evaluation designs in that it provides a systematic understanding of which student subgroups are most adversely affected and why.[1] Doing this shows that human changes arise in predictable ways from certain kinds of organizational participation.

Vocabulary and Conceptual Framework

Though the specific focus of this study is the educational system of the high school, the arguments found here should apply to a large class of organizations. A central characteristic of industrialized societies is the development of large complex organizations which intervene in the production of goods and services to members of the society. As such organizations proliferate, the probability of an individual's direct participation in them increases so that their social importance is at least twofold: as facilitators of goods and services; as providers of distinctive life experiences. Large organizations offer participation at a variety of levels: as worker, as

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[1] The argument here is that ordinary evaluation studies have the rather limited aim of determining whether a given program or practice results in an overall educational gain in contrast to its predecessor or to a corresponding practice in a control situation. Ordinarily evaluations do not specify which subgroups benefit most or which least, nor do they seek to explain variations in subgroup benefits.

manager, as client, as owner. A subset of bureaucracies, to which this study directly relates, offers a distinctive form of participation termed here process recipiency. Schools, hospitals, mental institutions, reformatories are all examples of such people-processing organizations.[1] Each possesses a clearly demarcated set of participants whose organizational role is to be the recipient of a process called in these varying contexts education, healing, therapy, and behavior correcting.[2] That is, as a general rule, the raison d'etre of such organizations is to process a clearly designated recipient class.

This idea may be elaborated into a full conceptual framework. The distinctive goal of these organizations provides a starting point for this conceptual development by suggesting a contrast with a familiar subset of bureaucracies--business organizations. In the business sector the creation of profit is the primary organizational goal, and managerial decision-making is quite normally subjugated to perceptions of results calculated on a profit basis. Sustaining this organizational pattern is the realization that failure to achieve this primary organizational goal may result in the desolution of the

---

[1]The idea that organizations which process people may have distinctive characteristics is not original. See Stanton Wheeler, "The Structure of Formally Organized Socialization Settings" in Orville G. Brim, Jr. and Stanton Wheeler, Socialization After Childhood: Two Essays (New York: John Wiley & Sons, Inc., 1966), pp. 53-116.

[2]The notion that students are recipients of a process suggests that they play a passive role. This connotation is not intended. Quite clearly students are expected to be active seekers of educational gains. This terminology is only meant to point up, for evaluative purposes, an analogy between specific subclasses of organizational participants and raw materials in industry. For the organization to be successful, it must succeed in socializing recipient class members; similarly, industry has to transform raw materials into an "improved" product.

organization itself, or what may be equally devastating from the manager's point of view, in a restructuring of its personnel. There is then a compelling logic, Darwinesque in nature, which forces business managers to ponder goal attainment. Are managers in people-processing organizations similarly concerned with goal attainment? What is the relationship between decisions concerning process and dominant organizational goals?

The major topics of this dissertation derive from a concern with the treatment of people in organizations. Because this treatment is supervised by other people, an attempt is made to apply to the situation of manager in a people-processing organization the logic which relates goal attainment to decision-making in the business model. Here the primary goal is to process people effectively, not to create profit. Consistent with his organization's central purpose, the business manager utilizes some form of cost accounting in order to assess alternative actions: how might a "process manager" act similarly? Clearly if he is to act in a parallel fashion he requires some system for process accounting. He needs a method for estimating the extent to which administrative actions promote the desired ends of process, be it education, therapy, healing, etc. This method should call attention to situations where processing is having adverse affects on recipient class members. In this dissertation we shall consider in detail such a process accounting method and we shall exemplify this method in a case study of grouping practices in a public high school.[1]

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[1]By way of clarifying the notion of process accounting and its meaning in a school context, we might consider the tantalizing and ironic history of

"scientific" accounting procedures used by school administrators to evaluate program effectiveness. The process accounting method developed in this study depends on a careful analysis of school records. The idea that school records should be examined systematically and critically by school administrators with the aim of evaluating school programs is not novel. Raymond Callahan demonstrates in Education and the Cult of Efficiency that the movement which resulted in the "professionalization" of school administrators in the period between 1910 and 1930 was closely tied to the adoption of "scientifically" rigorous, business-type accounting procedures by school managers. Callahan's discussion is worth summarizing because it illustrates how administrative review of school functioning has tended to avoid hard questions of program effectiveness in favor of non-educational concerns with program cost.

Callahan's thesis is that a variety of factors made highly-touted cost accounting procedures attractive to school administrators. These had become popular in business in the early twentieth century, a period in which business had great prestige. The "scientific" methods associated with Frederick W. Taylor's revolutionary industrial studies seemed to offer a means to administratively manipulate productivity. School administrators were vulnerable to criticism by lay school board members many of whom were businessmen. These factors disposed schoolmen of this period to acquire at least the lustre of business-like precision in their supervision of the school organization. Coincident with these pressures was the increased role of a small, dominent set of graduate training institutions with specialized programs in educational administration which laid great stress on the fiscal component of the administrator's role. What had started as a faddish style soon became a highly reinforced social system which defined the role of the school superintendent increasingly in terms of his relationship to the budget and decreasingly in terms of his relationship to educational program design. Callahan documents how this ethos has been perpetuated through the influence of graduate departments of educational administration.

Callahan is acutely aware of the irony in this wholesale borrowing from the business sector. Cost accounting in business directly relates to the dominent organizational goal of profit accumulation yet this has no counterpart in public education. His well-argued thesis is that educational decisions tended to be distorted into a framework of cost accounting wherein the value of programs was reckoned as their per-pupil cost and dishearteningly scant attention was paid to the educational and social values which schools claim to advance. Callahan uses the name "cult of efficiency" to denote this slavish and inappropriate attention to cost accounting.

See Raymond E. Callahan, Education and the Cult of Efficiency (Chicago: University of Chicago Press, 1962).

Implicit in the conceptual development of process accounting is the notion that specific organizational features are designed to promote the socializing goals of the organization. In schools these features include grouping and grading practices which are the subjects of the case analysis in this study. In other people-processing organizations, these might include work groups, therapy sessions, work release programs, etc. These strategic organizational features might be called process events since they are sharply demarcated and related to the processing goals. Process events are conceptually analogous to product lines in business in that they are intended to be the mechanisms through which organizational goals are realized. Like product lines, they may be readily manipulated by organizational managers to further the ends of the organization. Where the parallel diverges most sharply is in the area of concern to this study: product lines are cost accounted in business and so related directly to those organizations' primary goal of profit accumulation whereas process events are not systematically studied relative to goal attainment in people-processing organizations.

The vocabulary of process accounting instantiates a heuristic premise to be developed in this study. It suggests the possibility of attaching goal attainment estimates to process events and thereby evaluating them. Underlying this are the concerns expressed in the beginning of this chapter that organizations may inadvertently transform their participants. Any procedure which claims to evaluate program features in people-processing organizations should consider the possible dysfunctions of these.

The need to acquire extensive and systematic information relative to a specified program results in a close formal similarity in design between process accounting and evaluation. This correspondence is described in detail in Chapter Three which depicts the methodological schema of process accounting. The distinctive characteristic of process accounting pertains to an analytic mechanism which features subgroup differences relative to the experience of a particular process event. This mechanism involves the elaboration of subgroup typologies--a familiar device in survey analysis.

In summary, process accounting might be said to designate a complex kind of evaluation design. It might also be said to represent a general system of accountability, to use a term that is currently quite popular in educational circles.[1] Accountability implies increased visibility. And while this notion has an obvious reference to the politics of education, it also suggests something which is very much a premise of process accounting. It suggests that the usual, everyday functioning of schools should be systematically scrutinized. This is implied in the conceptual framework and vocabulary of process accounting. It is not normally implicated in the notion of evaluation, which tends to refer to the analysis of special, experimental arrangements. The concluding chapter to this study suggests that process accounting represents a sociological model of school accountability because it makes visible effects of structural arrangements.

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[1]No consensual definition of accountability in education is available. For a series of articles touching upon this subject, see Phi Delta Kappan, 52, December, 1970.

Scope, Plan, and Objectives of Study

The major objective of this work is to demonstrate a methodology for analyzing the effects of organizational arrangements on participants in people-processing organizations, and a fairly intensive analysis of several processing practices in a single high school will be presented. The scope of the present work is guided by the requirements of the case study so that most of the discussion which follows this chapter is specifically keyed to issues pertinent to this. Hopefully the foregoing discussion has suggested the generality and significance of the problems to be dealt with here *in situe*.

Between this chapter and a case study analysis in Chapter Six, we will deal with several kinds of intervening issues. In Chapter Two we will consider sociological theories relating the structure of groups to the effects of participation in them. Much of Chapter Two reviews the work of sociologists on the effects of educational groups. Citing R. K. Merton, we will observe that a unified theory of reference group behavior is implicit in these other writings. This unified theory provides several hypothetical explanations of the findings of the case study in Chapter Six. The case study analysis will elaborate this unified model of reference group theory and a major conclusion of this study in Chapter Seven will be to note the usefulness of process accounting for the further development of theory related to structural effects.

Chapter Three has already been described. It contains a discussion of process accounting design in formal terms. Chapter Four presents a

preliminary description of the research site, Transurbia High School. The sample for intensive analysis consists of two high school class cohorts: these groups and the grouping procedures in use at the school are profiled in Chapter Four. An important result of this discussion is to point up the rationale for the narrow focus of the case study in Chapter Six. In Chapter Five, the output measure used in the case study is described and validated as far as available data permit. This measure is called the Academic Identification Typology and it is based primarily on the students' final letter grades in several major subjects. Because the data file available to this study is limited, this measure serves as the exclusive dependent variable against which the effects of grouping practices are assessed.

Chapters Three through Five are technical preludes to the case study analysis. They are reference chapters. In Chapter Six each of seven process events related to Transurbia High School's ninth grade English program is examined with respect to the treatment of two student subgroups differing in social status. The differential impact of the seven process events is examined with respect to the two subgroups. This involves an analysis of their output measure profiles within particular process event conditions, e.g. a comparison of students within a specified ability level. Several large differences are found which cannot be attributed to school policy. As far as the available data allow, these findings are explained in terms of the unified reference group theory described in Chapter Two. This analysis serves to clarify several elements of this theory as well as to

demonstrate its utility in the explanation of student grouping effects.

Chapter Seven completes this study by summarizing the case study analysis in Chapter Six. This summary arches back to the issues considered so far in this chapter. It depicts a bond of common interest between the educator and the sociologist in seeking to understand the effects of organizational structures on students.

CHAPTER II

REFERENCE GROUP THEORY

This chapter describes and analyzes a set of sociological theories. These theories bear on the influence of educational groups and so relate directly to our central concerns. For the case study, we need a theory or set of theories to suggest why differing structural arrangements should result in certain patterns of student behavior. Ideally such theory would yield precise predictions of student behavior which might then be validated. Yet we will see that such theoretical precision is not presently available.

This discussion centers on sociological theory since sociology is the field most concerned with specifying the effects of group properties. Research in educational settings by sociologists has produced two apparently competing models of group influence neither of which is greatly detailed nor amenable to the production of validating predictions. In examining these, we will see that they may be reconciled to a large degree and shown to follow from Robert K. Merton's general and lengthy discussion of reference group theory. Neither theory appears to extend or enlighten Merton's perceptive analysis of group influence. More to the point, neither theory attempts to sort out the labyrinth of factors which Merton suggested would affect the nature of group influence. This review of the current state of the art of reference group theorizing in education will conclude that it remains more a general

conceptual schema than a theory of notable explanatory power.

This stirring of the waters in search of a high-powered theoretical apparatus to affix to the measurement component of process accounting will bring us to speculate on the apparent stagnation of theory development in the area of group influence. This situation in sociology contrasts vividly with the intense development of economic theories germaine to cost accounting. In recognition of this contrast, we will consider an hypothesis that the absence of refined theories concerning the influence of natural groups such as classrooms stems from the lack of systematic measurement of these.

Support for this thesis will be taken from a general consideration of measurement developments and concommittent advances in the explanatory systems of "hard" sciences. The upshot of this discussion will be to certify process accounting as a potential reifying agent for the development of social theory. It should promote more systematic theories of group influence in natural settings by facilitating theory validation and also by posing anomalous findings for theoretical examination. The meagerness of the sociological theory discussed in this chapter will not, of course, be resolved in the case study. But the inevitability of low-powered theory with respect to the influence of educational groups will be challenged.

Two Theories of Educational Group Influence

A review of sociological research on educational groups suggests there are only two major theories of group influence presently holding stage. (Later we shall say that these nominally independent theories are really only

tenets of a single, very broad and unified theory.) The basis for proclaiming this limited number of sociological theories is that the comparative study of differing educational contexts is a recent development that emerged fully only with the Coleman report, Equality of Educational Opportunity.[1] At present there is no significant sociological literature comparing the effects of intra-school groups such as classroom units so that most major sociological work on educational contexts has treated the school as the contextual variable. Such studies tend to be costly in that they are likely to involve a minimum of ten schools. The limited inventory of sociological theories concerning the influence of educational contexts is partly a direct result of the rarity of contextual studies but it also reflects the pragmatic, atheoretical tint to much of the work which has occurred.[2] These studies tend to focus on practical issues set by the funding agencies and underexplore the theoretical implications

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[1] James S. Coleman, et al., Equality of Educational Opportunity (Washington: U. S. Government Printing Office, 1967).

[2] The Coleman report, op. cit., is an excellent example of an "atheoretical" contextual study. Less glaring is Robert E. Herriott and Benjamin J. Hodgkins, Sociocultural Context and the American School: An Open-Systems Analysis of Educational Opportunity (Tallahassee, Florida: Center for the Study of Education, Institute for Social Research, Florida State University, January, 1969). Their discussion suffers from extreme generality, a condition that the authors note in commenting on their central hypothesis: "this hypothesis (that the more modern the sociocultural context of the school, the more modern its organizational structure and functioning) is obviously very broad and only one of many which could be offered in exploring the school as an open sociocultural system. It is proposed at this time because it can be tested with existing data," (p. 135). Support for the speculation that the paucity of theory characteristic of contextual studies lies partly with the perceived, atheoretical interests of clients may be found in the research chronicle by James A. Davis, "Great Books and Small Groups: An Informal History of a National Survey," in Phillip E. Hammond (ed.), Sociologists at Work (Garden City, New York: Doubleday & Company, Inc., 1967), pp. 244-269.

posed by contextual analysis.

A notable illustration of the underplay of social theory which is at once a splendid example of the first "type" of social theory of educational groups is to be found in the Coleman report itself. The research problem which confronted Coleman and his associates was the gauging of educational opportunity as a factor of school context. This is a problem of obvious social, political, and philosophical interest and these aspects are amply reflected in the study report. One of Coleman's major and most celebrated findings was that the social class mix of students in a school environment was an important determinent of student achievement test performance. Another major finding was that school plant and staffing were not evident sources of lower school performance in the ghetto in comparison to the suburbs. These findings seemed to imply an obvious policy response. If the school performance of ghetto youngsters was to be upgraded, these children should be afforded the opportunity to attend school with children from higher socio-economic groups. The theory by which Coleman "explained" the effects of social mix is termed "environmental press." Though clearly central to the import of his study, it is not greatly elaborated in the report.

Coleman's notion of peer group influence may be gleaned in the passages quoted below. Later we will see that other educational researchers utilizing this notion also underexplain the nature of the influence mechanism:

> Attributes of other students account for far more variation in the achievement of minority group children than do any attributes of school facilities and slightly more than do attributes of

staff. (p. 302.)[1]

> The results suggest, then, that the environment provided by the student body is asymmetric in its effects, that it has its greatest effect on those from educationally deficient backgrounds. The matter is of course more complex than this simple relation, doubtless depending on the relative number of high and low achieving students in the school and on other factors. (p. 304.)

> The higher achievement of all racial and ethnic groups in schools with greater proportions of white students is largely, perhaps wholly, related to effects associated with the student body's educational background and aspirations. This means that the apparent beneficial effect of a student body with a high proportion of white students comes not from racial composition per se, but from the better educational background and higher educational aspirations that are, on the average, found among white students. The effects of the student body environment upon a student's achievement appear to lie in the educational proficiency possessed by that student body, whatever its racial or ethnic composition. (pp. 307-310.)

What emerges from Coleman's discussion is a sense of the potency of school context as defined by student composition rather than an understanding of the interior dynamic of the influence mechanism.

The thesis that a dominant peer group imparts distinctive value orientations and behavioral norms to most students in the social system of the school is not original to the Coleman report. Indeed earlier work by Coleman himself had reached a similar conclusion.[2] Alan B. Wilson describes this process as the "lateral diffusion of sentiments among peers."[3] While this

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[1]Page references here and immediately below refer to the Coleman report, op. cit.

[2]James S. Coleman, The Adolescent Society (New York: The Free Press of Glencoe, 1961).

[3]Alan B. Wilson, "Social Stratification and Academic Achievement," in A. Harry Passow (ed.), Education in Depressed Areas (New York: Teachers College Press, 1963), p. 218.

mechanism is not fully elaborated in Wilson's various writings, he appears to suggest that school contexts offer a differential selection of adolescent role models.[1]

> While peers may have an influence on achievement, it is their behavior in the school setting and not their generalized attitudes as expressed out of school which we should focus on to illuminate the process of influence. Variations in the modal socio-economic composition of a school, and accompanying variation in cognitive development in the primary grades, generate norms of interpersonal behavior and role-expectations which acquire a force of their own and have a redounding impact upon the students in the situation. (Wilson, 1969, p. 29.)

Similarly, Alexander and Campbell suggest that a balance mechanism operates so as to produce symmetry between a student's own evaluation of a cognitive object and its evaluation by an attractive other.[2] Their examination of student friendship patterns in relationship to college plans suggests this interpretation by demonstrating greater similarity of college aspiration among friends, controlling for a variety of background factors. Kandel and Lesser also report a direct positive association between attitudes of friends with regard to college plans and note (consistent with the Coleman report) that this factor seems of greater importance than factors measuring the

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[1]Alan B. Wilson, "Residential Segregation of Social Classes and Aspirations of High School Boys," American Sociological Review, 24, 1959, pp. 836-845, and The Consequences of Segregation: Academic Achievement in a Northern Community (Berkeley, California: The Glendessary Press, 1969).

[2]C. Norman Alexander, Jr., and Ernest Q. Campbell, "Peer Influences on Adolescent Educational Aspirations and Attainments," in Ronald M. Pavalko (ed.), Sociology of Education (Ithasca, Illinois: F. E. Peacock Publishers, 1968), pp. 101-113.

overall quality of school.[1]

These various studies all suggest an imprint mechanism whereby values are transmitted from adolescent to adolescent. The term "environmental press" seems especially appropriate to denote this theoretical orientation.[2] We shall attribute to it this provisional meaning: when a value or norm characteristic X is found widely extant in an adolescent group, any adolescent admitted to this group is likely to acquire X (be it through friendship formation, admiration for one or several group members, or the informal persuasion of many group members). This formulation calls attention to two basic features of this theoretical orientation: the value imparted has its patent in the peer group; the dynamic of transmission may involve a single influential, several or many influentials interacting with the group member.

A second sociological theory of group influence has its origins in research findings which could not immediately be reconciled with this notion of environmental press. Studying the relationship between graduate career plans of college students and undergraduate school quality, James A. Davis was prepared to observe that the higher the quality of the undergraduate institution, the greater the pressure toward continued graduate education.[3]

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[1]Denise Kandel and Gerald S. Lesser, "School, Family, and Peer Influences on Educational Plans of Adolescents in the United States and Denmark," Sociology of Education, 43, 1970, pp. 270-287.

[2]See especially D. C. Thistlewaite, and N. Wheeler, "Effects of Teacher and Peer Subcultures Upon Student Aspiration," Journal of Educational Psychology, 57, 1966, pp. 35-47.

[3]James A. Davis, "The Campus as a Frog Pond: An Application of the Theory of Relative Deprivation to Career Decisions of College Men," American Journal of Sociology, 72, 1966, pp. 17-31.

However, when he controlled for scholastic aptitude, and freshman career preferences, (but not for student grade point average), Davis was able to marshall data indicating a zero or negative correlation between school quality and the decisions of male undergraduates to enter high-performance career fields. This finding contravenes our common sense suspicion that high quality undergraduate institutions should have a leavening effect on the career choices of their students. It also runs counter to a direct application of the notion of environmental press since it suggests that students are somewhat less likely to acquire a characteristic X if they associate with others who seem likely to acquire this characteristic. To phrase the Davis finding at an individual level so that its bizarre aspect is most prominent would be to observe that a bright student, intent on acquiring a Ph.D. in nuclear physics, is more likely to preserve that intention through four years at Podunk University than at M.I.T.

As a means of explaining this apparent anomaly, Davis draws on the theory of relative deprivation as this emerged from the work of Stouffer and his colleagues on the American soldier.[1] His interpretation is quoted below:

> The theory of relative deprivation suggests the following interpretation of our data: (a) In making career decisions regarding the high-performance fields (which generally require graduate training), the student's judgment of his own academic ability plays an important role. (b) In the absence of any objective evidence, students tend to evaluate their academic abilities by comparison with

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[1]Samuel A. Stouffer, et al., The American Soldier: Adjustment During Army Life (Princeton: Princeton University Press, 1949). I, II.

> other students. (c) Most of the other students one knows are those on one's own campus, and since GPA's (grade point averages) are reasonably public information, they become the accepted yardstick. (d) Comparisons across campuses are relatively rare, and where they take place it is difficult to arrive at an unambiguous conclusion because institutional differences are not well publicized; even when these differences are known, there is no convenient scale comparable to GPA for drawing conclusions. (e) Since more conclusions are drawn on the basis of GPA standing on the local campus than by comparison with students on other campuses, GPA is a more important variable in influencing self-evaluations and, consequently, career decisions. (Davis, 1966, p. 25.)

In apparent contrast to environmental press, the theory of relative deprivation suggests that students do not acquire characteristics solely by means of a direct imprinting. Instead it suggests that they use their peers as a reference group to formulate self-evaluations so that certain student contexts may produce unrealistically low self-estimates. Davis dignifies this phenomenon with the term "frog pond effect" which he borrows from the aphorism, "It is better to be a big frog in a small pond than a small frog in a big pond."

Davis himself is acutely aware of the apparent opposition of "frog pond effects" and the theory of environmental press. His remarks on this point are very suggestive, and again, we shall quote him at length:

> There is no rule that all compositional effects should have the same statistical structure, but it should be noted that our data constitute an exception to a trend of research findings.
>
> The contradiction may perhaps be resolved by recalling Kelley's distinction between the normative function of reference groups, "sources and reinforcers of standards" and the comparative function, "comparison point against which the person can evaluate himself and others." Kelley's distinction suggests the following general contextual hypothesis: The greater the proportion of a group possessing or indorsing some characteristic X, the more likely it is that a newcomer will tend to become favorable toward X and the less likely it is that he will view himself as possessing X to any unusual degree. (Davis, 1966, p. 30).

The distinction which Davis attributes to Kelley concerning the normative and comparative functions of reference groups may also be found in Merton's work on reference groups to which we shall next turn.[1] In addition to reconciling the apparent opposition of the theoretical perspectives described above, our examination of Merton's work will suggest the scope and complexity of group influence theory and illustrate a range of factors not systematically treated in the research we have reviewed.

A Unified Theory of Group Influence

Merton's discussion of reference group theory is contained in two lengthy essays.[2] The concept of relative deprivation (frog pond effect), as it emerged from the work of Stouffer et al, is a post hoc explanatory schema:

> We may thus tag the major function of the concept of relative deprivation as that of a provisional after-the-fact interpretive concept which is intended to help explain the variation in attitudes expressed by soldiers of differing social status. And since after-the-fact interpretations have a distinctive place in the ongoing development of theory, we shall later want to consider this characteristic of the concept of relative deprivation at some length. (p. 230).[3]

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[1]See Harold H. Kelley, "Two Functions of Reference Groups," in G. E. Swanson, T. M. Newcomb and E. L. Hartley (eds.), Readings in Social Psychology (New York: Henry Holt & Co., 1952), pp. 410-414.

[2]Robert K. Merton's discussion of reference group theory appears in two articles both of which may be found in his collection of essays, Social Theory and Social Structure, second edition, (New York: The Free Press, 1957). The first article, written in collaboration with Alice S. Rossi, is entitled "Contributions to the Theory of Reference Group Behavior," pp. 225-280, and the second, "Continuities in the Theory of Reference Groups and Social Structure," pp. 281-386.

[3]This and subsequent quotations in this section are from Merton, op. cit.

Merton's appraisal of this aspect of relative deprivation seems of special importance to our present discussion since both theoretical orientations described in the previous section were also inductive, post hoc schemas. What follows from this characteristic is rather enfeebling from the point-of-view of theory development. Merton sets this problem into a perspective which brings some requirements for the development of useful theory into focus:

> Since both membership groups and non-membership groups, in-groups and out-groups, have in fact been taken as assumed social frames of reference in these interpretations, this at once leads to a general question of central importance to a developing theory of reference group behavior: under which conditions are associates within one's own groups taken as a frame of reference or self-evaluation and attitude-formation, and under which condition do out-groups or non-membership groups provide the significant frame of reference? (p. 233).

Though not explicit in this statement of the problem, Merton was later to distinguish "frames of reference" for self-evaluation and attitude formation referring, as does Davis, to Kelley's distinction between the "normative" and "comparative" functions of reference groups. However vaguely this distinction is treated in the above passage, Merton's probing of the awesome possibility of locating any group as a frame of reference is a problem not exposed in our previous discussion.

Before exploring this point further, we will consider Merton's presentation of the basic unity of the "normative" and "comparative" function of reference groups:

> Stemming from the theoretic background provided by James, Cooley and Mead, and by Hyman, Sherif and Newcomb, the hypothesis holds that, insofar as subordinate or prospective group members are motivated to affiliate themselves with a group, they will tend to assimilate the sentiments and conform with the values

> of the authoritative and prestigeful stratum in that group. The function of conformity is acceptance by the group, just as progressive acceptance by the group reinforces the tendency toward conformity. And the values of these "significant others" constitute the mirrors in which individuals see their self-image and reach self-appraisals. (p. 254).

The unifying dynamic which brings the normative and comparative features of reference group behavior together is the desire for acceptance by the prospective group member which motivates his acceptance of group norms and thus leads him to evaluate himself in terms of these norms. What was posed as an opposition in terms of environmental press and frog pond effect may now be seen as a compatibility. Depicted as an individual level effect, our prospective M.I.T. engineer will tend to acquire those values and work habits characteristic of that highly academic environment even as his opinion of his own abilities is lowered by comparison with these high standards. It would appear then that environmental press and frog pond effects are different aspects of a single, powerful social phenomenon--that individuals acquire values, behavioral norms, and self-images in relation to standards derived from groups or individuals in their environment.

Specifying the dynamic in this way brings us back to the full force of Merton's previously quoted analysis of the central problem of reference group theory. The salient issue is not whether the acquisition of standards is a social act (involving reference to others) for this appears certain. The crux of the theoretical problem is to specify circumstances which result in a particular group or individual being utilized as either a normative or a comparative standard or both.

The complexity of this issue may be inferred from the simple fourfold table below. If we disregard such obvious possibilities as that an individual might acquire standards from a group to which he does not belong (anticipatory socialization) or that a group might present several conflicting standards to a prospective member, this table still suggests four basic possible outcomes of group participation. Considering the cells separately, cell I refers to an instance where group membership supplies both normative and comparative standards. This is the paradigm case of reference group behavior since the group is seen to function as a reference in a full and consistent manner. Cell IV is the logical counterpart in that it depicts a situation where the group has no influence with regard to the diffusion of standards. Cell II points up the intriguing possibility that a group might supply a basis for self-estimates without otherwise imparting its normative climate, whereas Cell III symbolizes an opposite effect, that the group might provide value and/or behavioral norms but not a standard for self-evaluation. Since the existence of an influence in any of these directions is a matter of degree rather than an absolute yes or no, these four cells simply summarize the most elemental possibilities of group participation.

Group Membership Supplies:

		Normative Standard:	
		Yes	No
	Yes	I	II
Comparative Standard:	No	III	IV

If we reconsider our previous discussion of educational group influence with this diagram in mind the theoretical meagerness of the educational researchers' work on contextual effects becomes evident. None of the research cited sought to explain why particular educational contexts have certain reference effects in any sort of comparative way. From a theoretical point of view, the most sophisticated of the research reports, the Davis article on frog pond effects, did not seek to examine structural variations in contexts as a basis for explaining an apparently widespread comparative reference effect.[1] Davis attributed this effect to the influence of a locally based, academic grading scale but he did not interpret this structural form as a variable itself. By implication the mere receipt of any grade in any context whatsoever is equally likely to promote comparative reference behavior--an interesting but untested thesis. We do not learn the conditions under which grading practices promote or inhibit comparative reference group behavior. In short, we are not informed by this research on the nature of the reference group dynamic.

Such inadequacies are defensible to some degree in light of Merton's own elaborate reflections on the complexity of characterizing group structure. Merton presents the following "provisional" list of "theoretically significant properties of group structure" which, he suggests, might influence the selection

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[1]A recent study of high school context reaffirms the need for close examination of school structure if the comparative and normative functions of reference groups are to be separated empirically. See Joel L. Nelson, "High School Context and College Plans: The Impact of Social Structure on Aspirations," American Sociological Review, 37, 1972, pp. 143-148.

of particular membership groups as reference groups.[1]

1. Clarity or vagueness of social definitions of membership in the group
2. Degree of engagement of members in the group
3. Actual duration of membership in the group
4. Expected duration of membership in the group
5. Actual duration of the group
6. Expected duration of the group
7. Absolute size of a group, or of component parts of a group
8. Relative size of a group, or of component parts of a group
9. Open or closed character of a group
10. "Completeness": ratio of actual to potential members
11. Degree of social differentiation
12. Shape and height of stratification
13. Types and degrees of social cohesion
14. The potential of fission or unity of a group
15. Extent of social interaction within the group
16. Character of the social relations obtaining in the group
17. Degree of expected conformity to norms of group: toleration of deviant behavior and institutionalized departures from the strict definitions of group-norms
18. The system of normative controls
19. Degree of visibility or observability within the group
20. Ecological structure of the group

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[1]This list is derived from Merton, pp. 310-326.

21. Autonomy or dependence of the group
22. Degree of stability of the group
23. Degree of stability of the structural context of the group
24. Modes of maintaining stability of the group, and of the structural context
25. Relative social standing of groups
26. Relative power of groups

Even if we allow, as does Merton, that some of these properties may be collapsed together and that others may prove insignificant, the magnitude of the sorting operation is not likely to whet the appetite of many empirical researchers. Still Merton's discussion gains stature with the passage of time: in the fifteen years since he published this list of group properties, reference group theory has remained a highly general, post hoc explanatory schema. The failure of reference group theory to mature seems linked to the continued disregard of group structure variations. In the next section we will suggest that this disregard is itself rooted in the absence of widespread, systematic measurement of group characteristics.

Measurement and Theory

We shall begin with a statement that usefully embodies the substantive argument of this section. Science and logic may be differentiated by the dependence of the former on empirical data in contrast to the strict independence of the latter. Otherwise expressed, it is not logic if it requires evidence; it is not science unless there is evidence or unless evidence

may be imputed. Reflection will show this proposition to be self-evident but its truth is nicely dramatized and related to our concerns here by reference to the famous delayed validation of Einstein's special theory of relativity. A notable aspect of this theorem concerned the relativity of time and motion, so that, by implication, bodies in motion from one another would experience time differentially. Einstein's theory permitted the derivation of a number of testable hypotheses along these lines, yet their testing required instrumentation and transport technologies that have become available only in recent years. Nonetheless, the development of Einstein's theory required a system of measurement, the notion of time and motion as inhabitants of a fixed, consensually-validated scale. That Einstein's work was to cast the fixity of the scale in doubt only emphasizes the dependency of his theory on the idea of measurement. Without this idea, there would have been no basis for deriving testable hypotheses, no way then for bringing data to bear on theorem, no science. The development of scientific theory depends on the availability of measurement systems and this is prior to the reliance of science on measurement itself. That is, in the case of the Einstein example, theory development did not require refined instrumentation but it did require notions of scale and order with which to stipulate empirical relations.

Keeping this point in mind, we see Merton's discussion of reference group theory several removes from the generation of scientifically verifiable hypotheses. Two characteristics of his discussion account for this distancing. With respect to his list of group properties, examination would reveal most of

these in desperate need of further elaboration and simplification. (This point will not be argued here.) Secondly, for most of these properties, no immediately evident scale suggests itself. The suspicion here is that the absence of scientifically verifiable hypotheses with respect to reference groups may be partially explained by the unavailability of group property measures. We do not have an immediate sense of a scalar dimension called "types and degrees of social cohesion" or "modes of maintaining stability of the group and of the structural context." It is not merely the case that our social clocks are crude: they are for the most part nonexistent. More simply, we do not measure organizational properties in any systematic way.

There is an additional dependency of scientific theorizing on measurement of which the Einstein example would not be a good illustration. Theory such as Einstein's may be born of logic joined to propositions concerning empirical realities. Yet science does not only advance in this manner. It is not uncommon for measurement systems themselves to yield data which cannot be explained by existent theory. The explanation of anomolous findings may be a source of theory refinement and may even promote major reorderings of a discipline's theory.[1] Or, measurement may provide evidence of underlying phenomena for which theoreticians may then seek explanations. The relationship of X-ray crystallography to the generation of Watson's and Crick's solution to the structure of DNA is

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[1] Thomas S. Kuhn, The Structure of Scientific Revolutions (Chicago: The University of Chicago Press, 1962).

a case in point.[1] For these reasons also, the absence of social context measures greatly retards the development of social theory in this area.

A final clarifying note on the relationship of measurement to process accounting will bring this chapter to a close. The process accounting methodology described in the next chapter embodies a reductionist conception of group properties. While it is consistent with the work of sociologists on educational contexts, it may leave some social theorists unhappy. Most of Merton's group properties are explicitly group-level, and he seems reluctant to allow their transposition to individual-level properties. For example, concerning "degree of engagement of members," Merton stipulates that this property refers to "the extent to which the degree of engagement in the group is normatively prescribed and actually realized" rather than to attitudes or senses of identification that individual group members may experience with respect to the group.[2] In contrast, Coleman and Wilson allow that school contexts may be defined in terms of the balance of different student types. Accordingly, the proportion of middle class students in a group is held to be a property of the group. (Surely the proportion is not an individual's property!)

This issue shall not be further elaborated except to note that the reductionism employed in the case study is consistent with a supposition of contextual effects. It is not kindred to Robert Hauser's recent assertion that

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[1] James D. Watson, The Double Helix (New York: Atheneum, 1968).

[2] Merton, op. cit., p. 311.

such group properties are merely poor measures of individual-level phenomena.[1] Instead, process accounting allows the possibility that certain sorts of contextual mixes of individuals may possess emergent characteristics which influence group members in ways which cannot be predicted from the properties of individuals apart from context. The bias of the case study toward individual-level properties does not imply a rejection of the potential saliency of non-reducible group properties such as status differences. With the present methods, process events could also be characterized according to group-level properties. In the case study setting, there was not sufficient variation in these to make such an approach worthwhile.

An important role of theory in science is to explain findings. The unified theory of reference group behavior discussed in this chapter will provide interpretations for the findings of the case study analysis in Chapter Seven. Our discussion here has pointed out the post hoc and very general nature of this theory and it has suggested ways in which a measurement system such as process accounting might stimulate the development of more precise theory. In the next chapter we shall discuss the methodology which underlies this measurement system. In so doing, we will describe the logic by which the findings themselves are identified.

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[1] Robert M. Hauser, "Context and Consex: A Cautionary Tale," American Journal of Sociology, 75, 1970, pp. 645-664. See also, "Hauser Replies," American Journal of Sociology, 76, 1970, pp. 517-520, and Allen H. Barton, "Comments on Hauser's 'Context and Consex,'" in Ibid., pp. 514-517.

CHAPTER III

PROCESS ACCOUNTING:

A METHODOLOGICAL PERSPECTIVE

The purpose of this chapter is to describe the research methods utilized in this study and to discuss the appropriateness of these to the problem being studied. Under the topic of research methods, we will consider first the general design requirements for process accounting, the kinds of data that need to be collected and the methods of data analysis that might be employed, and finally several specific design advantages of school record monitoring. School record monitoring is a species of process accounting. It shares the general features of this class but has several distinguishing marks of its own. An object of this chapter is to make clear the meaning of these terms. As a first approach, we will consider process accounting in relationship to the research problems which this study addresses.

Research Problem: Assessing Institutional Process

In Chapter One we supplied the term "people-processing organizations" to those institutions whose primary intended function is the providing of a process to a recipient class. We noted an important difference between such organizations and business corporations, that the latter only have the convenient measure of profit as a guide to organizational success. Now we will examine

at a common sense level several consequences related to this difference in performance measures. The object is to show the importance of measuring process and to note some common obstacles to the completion of this task. We will then consider the properties of process accounting systems and discuss their ability to deal with these obstacles.

Business and people-processing organizations are both goal-directed. In the case of business enterprises, most activities are either directly related to the creation of profit or they relate to the maintenance of subunits which in turn aim to create profit.[1] Activity in people-processing organizations is tied to the supplying of a process or to maintaining subunits which supply this. Let us consider the connection between purpose and activity in these organizations by imagining the consequences for organizational members of a widespread failure to achieve these broadly stated goals. In the case of a business firm, the consequences are easily imagined: either the organization would collapse through bankruptcy or it would yield to outside pressures for reorganization of its personnel, possibly including the infusion of outsiders. Mechanisms for these changes include mergers, proxy fights, court-directed reorganizations, "personnel shake-ups," etc. In most instances, failure to achieve profit at a sufficient level is the trigger for these major adjustments. The configuration of business enterprises is conditioned in this manner by its

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[1]The correctness of this statement is limited, though not contradicted, by the emergence of management as a sometimes self-serving force within the structure of the modern corporation. See Adolf A. Berle and Gardiner C. Means, The Modern Corporation and Private Property. Rev. ed. (New York: Harcourt, Brace, and World, 1968).

purpose and by the measurement of its success.

In a similar vein, what would be the consequences for members of a people-processing organization should it fail to supply a process adequately? Suppose a school system were to fail to educate its students?[1] Considering the almost ubiquitous harsh criticism of public school systems across the United States, it is hard to imagine that such failures have not occurred. Interestingly, however, it is quite difficult to locate specific instances of their occurrence or to stipulate the consequences. This situation is equally true for mental hospitals, schools for the retarded, prisons, etc., and it is no less likely that a failure to deliver process has occurred in at least some of each of these types.[2] This condition suggests a dismal truth about "process" organizations, that they might fail to achieve their purpose and their internal

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[1]Performance contracting in education goes to the heart of these questions. Performance contracting involves the setting of measurable objectives and the evaluation of administrative performance in terms of these measurements. What we are noting here is the blunting of "organizational consequences" in situations where the measurement of successful performance is not specified.

[2]Several recent exceptions to this claim deserve mention. Prison riots such as occurred at Attica State Prison in New York and an occasional expose such as the television reports on Willowbrook State School for the Mentally Retarded suggest the possibility of locating institutional failures. Especially in the case of Willowbrook, where abundant evidence of gross patient neglect was brought forth, the identification of failure seems incontestable. It is worth noting that this identification resulted in significant changes, e.g. the restoration of anticipated budget cuts for the New York State Department of Mental Hygiene. Would a system for process accounting capable of discerning more subtle failures also provoke policy change? For an account of the Willowbrook reporting, see Geraldo Rivera, Willowbrook: A Report on How It Is and Why It Doesn't Have to Be That Way (New York: Random House, 1972).

organization might persist unaltered by this failure. The difficulty here is at least partly related to the absence of any accepted standard of process measurement at the institutional level.

This point is nicely illustrated with reference to schools. Apparently counter to our claim that process measurement is not available, we find in schools a plethora of educational process measurement instruments, nationally standardized achievement and aptitude tests. Tests exist in abundance for all levels of education and for many specific subject and cognitive areas. Though these tests are used primarily as diagnostic devices at the level of the individual student, class level results are often released to the public. However, these test profiles should not be interpreted as evidence of institutional process per se. Several characteristics of these cross-sectional, class year by class year, test results invalidate this use:

1. Cross sectional figures do not allow for changes in student composition which in some districts exceeds 20% of the total student population each year.

2. These figures provide no means of distinguishing gains rightly attributed to the school context from gains which stem from the home or other non-school factors.

3. Results from even the most comprehensive of the test batteries measure only a limited part of a school's process goals.

These three factors might be termed: (1) recipient class turnover, (2) contamination by extraneous factors, and (3) the limited scope of available measurement instruments. And they impede a determination of the effectiveness of process delivery in mental hospitals, prisons, reformatories, as well as schools. The relative totality of several of these other institutional contexts minimizes the

effects of extraneous factor invalidation, but in general all three prohibit methods such as cross-sectional analysis.

There is a further reason why such analysis is of little value in shaping institutional policies. This is again demonstrated with reference to schools. The process measurement use of test results in New York City public schools is a case in point. Each year the central school board releases reading test figures by grade level for every school in the system. When schools are compared with their own previous year's results, many are found to show a "net loss" in reading level, that is a failure to advance one grade level in reading commensurate with one grade level in school attendance for a class cohort group. School administrators disclaim the meaningfulness of these comparisons, in part citing the three factors discussed above and significant actions seem rarely to result from the release of the figures or the controversy that follows in their wake. This is so even though the public appears to interpret these test result comparisons as meaningful, valid process measures.

The cause of this dissociation of response from stimulus is readily traced if we extend our comparison to profit statements in the business sector. The justifiable claim of educators that the test results are poor measures of school success does not alone explain their disuse in policy determination for there is considerable public political pressure for this use. The cross-sectional, grade-level reading results would be of very limited usefulness as a guide to action even if they were valid measures of global process. Similarly, if we abstracted only the net profit balance from a corporation's

annual accounting, we could derive only very limited advice, though this is a valid performance measure. The great usefulness of cost accounting in business is that it allows a determination of relative profit associated with a company's various merchandise lines: it separates wheat from chaff whereas the net balance alone confounds them. Grade level results are also poor providers of useful distinctions for grade levels are not readily manipulated subunits. A school principal, discovering that his third grade was "under-performing" relative to other grades in his school, cannot excise this unit as a businessman might a profitless line of lingerie. This underscores a general requirement of any accounting system that is to be policy related: accounting must attach to units that can be manipulated. Product lines meet this requirement in business; in people-processing institutions, subunits in which process is supposed to occur conform to this demand. In the case of schools of a traditional kind, the classroom is a natural process accounting unit.

This discussion raises several interesting questions. If school officials do not utilize test scores to assess program effectiveness, how are these determinations made? Also, how are we to explain the abundance of standardized tests and the systematic record keeping upon which process accounting builds if these data facilities are not meant to aid program analysis? The answer to this second question requires a consideration of both the internal, system maintenance needs of school organizations as well as a consideration of the functions of schools with respect to their external

environment. When one considers the enormous amount of effort that school employees expend on the production of these records, it is not surprising that this activity responds to many different needs. First, considering some of the internal uses of records data, we find that tests and letter grades are used to help sort students into groups, to inform students of their relative standing in their peer group and thus to condition their behavior both with respect to their peers and to teachers, to depersonalize the evaluative component of the student-teacher relationship, to inform the student of his progress and thus to delegate to him responsibility for altering or maintaining this condition, etc. Similarly, with respect to the external environment, we find testing and record keeping rationalized because schools are repositories of information which receiving institutions want to possess, i.e. employers want to know the aptitudes of students in terms of various national norms. This also helps explain why student record keeping is very often quite meticulous for it points up that a major function of the school system is to document student persona for the benefit of these recruiting institutions. Although this documenting function is generally consistent with the major purpose of educating, it is doubtful that record keeping would be as extensive were the high school degree a valued end object and not an intermediate object between student and employer or student and college. And there is an additional use of school records which also bears noting. While a bulky counselor's folder is probably a rational aid in the determination

of a student's academic program, it also confers dignity on the counselor in his interactions with the student and the student's parents. Record keeping and test-giving safeguard school officials from the appearance of capriciousness in the treatment of students. These several explanations for the panorama of records and measurements found in schools should dispel the notion that these data must relate to a systematic and critical analysis of school program features. This also brings us back to our earlier question: how are program features actually evaluated by school officials?

Unquestionably school officials do make program judgments though it is also clear that the usual format of school record keeping limits the applicability of records' analysis to this judgmental process. Alternative devices including the voicing of dissatisfactions by parents, students, and staff very likely play major roles in the formulation of program assessments. It has been suggested that this process of evaluation is largely political rather than systematic or scientific.[1] There is little reason to suspect that many school administrators would oppose this view since in our society school administrators are supposed to be politically sensitive. These remarks, however, point up an important contrast between the process accounting of school programs which is scientific in its approach

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[1]See David E. Wilder and Alan S. Blumner, Some Sociological Aspects of Student Allocation in Two Racially Mixed Suburban High Schools, op. cit., Chapter Three, especially p. 58.

and the reality of program analysis which tends to utilize data in order to rationalize politically motivated decisions.

Let us review then this second critical comparison of performance measurement in business and process institutions keeping in mind that the reality of performance measurement in schools is probably political and that this reality has not been examined in this study.

Our critical juxtaposition called attention to the absence of valid performance measures with regard to the effective delivery of process. Our claim now is that regardless of their invalidity, cross-sectional analysis of "non-natural," process accounting units is largely void of policy implications.[1] Such analysis cannot be used because it points up global conditions to administrators whereas their job function concerns the supervision of natural units. Organizations designed to provide process are substructured into specific process treatment subunits such as work units in prisons, therapy sessions in mental hospitals, and classrooms in schools. Administered process occurs in such units which are amenable to systematic control and variation. If process accounting is to be relevant to administrative

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[1]Undoubtedly, such cross-sectional measures have occasionally and misguidedly been used by school administrators as when a school principal decides that his teachers should return to the "basics" so that next year's test profiles will show improvements. There is no absolute prohibition on faulty reasoning among educational administrators.

actions in a fashion analogous to cost accounting in business, it will have to relate to such administrative or natural work units.

In reviewing differences in performance measurement between business and process organizations, we have discovered four requirements for the development of a valid and useful process accounting system. To be useful, process accounting must attach to administratively manipulatable subunits; to be valid, it must control for recipient class turnover, it must separate out performance gains which stem from extraneous factors, and it must incorporate a scope of performance measures appropriate to the breadth of the organization's process goals. A valid and usable process measurement system would serve the same purpose in process organizations as cost accounting in business: it would facilitate the improvement of goal-directed performance. In the remainder of this chapter we will describe the structure of process accounting and attempt to demonstrate that it meets these four requirements.

Process Accounting: Design and Logic

In the simplest form of process accounting, process events are analyzed in a manner similar to a very crude experimental design. We have used the term "process event" to denote an administratively manipulatable activity which is intended to facilitate the acquisition of a process by recipient class members. Pre- and post-event observations are assembled on the recipients, and

differences in these observations are presumed to be the result of the process event. Campbell and Stanley are sharply critical of this form of experimental design which they diagram as $O_1 \times O_2$, where $[O_2 - O_1]$ is attributed to X or the process event.[1] Much of their brilliant article on study designs consists of documenting the sources of internal invalidity left uncontrolled by this simple design. Among the more devastating failures of this pattern, they note that it fails to control for the effects of history (external events as well as intra-session factors), subject maturation, the effects of testing or of the pre-event observation itself, statistical regression, subject selection and mortality, and the interactive effects of selection with these other factors.

What increases the power of process accounting over this logically flacid form of experimental design is the large number of X's that are treated, and the varying and sometimes large number of O's associated with any particular X. A fuller and more accurate depiction in the symbolic schema of Campbell and Stanley would be:

$$O_1\ O_2 \ldots O_{n_{X_A}}\ X_A\ O_{nX_A+1}\ O_{n_{X_{A+2}}} \ldots O_{n_{X_{A+n'}}}$$

$$O_1\ O_2 \ldots O_{n_{X_B}}\ X_B\ O_{n_{X_B+1}}\ O_{n_{X_B+2}} \ldots O_{n_{X_{B+n'}}}$$

$$\vdots$$

$$O_1\ O_2 \ldots O_{n_{X_Z}}\ X_Z\ O_{n_{XZ+1}}\ O_{n_{X_{Z+2}}} \ldots O_{n_{X_{Z+n'}}}$$

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[1] Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-experimental Designs of Research (Chicago: Rand McNally and Company, 1966), pp. 7-12.

The X's are different process events; the O's are observations of goal performance-related parameters; the subscripts under the O's indicate that the number (and nature) of the O's might vary from one process event to another.[1]

Some of the greater logical force of this measurement system over the simpler (O_1 X O_2) pattern criticized above stems from the dynamic measures which the various pre-event O's supply. Multiple pre-event observations allow us to characterize input to particular process units in terms of rates of change. For example, we might note of an eleventh grade English classroom that it received a student cohort whose previous two years grade experience had been consistently high, whose average attendance during this period remained static, whose reading test scores showed one year gains over each of the two previous reading test intervals and so forth. Such measures provide a reasonable basis for predicting output effects. Thus the basis for process accounting is no longer simple $[O_2 - O_1]$ differences but deviations of $O_{n+1} \ldots O_{n+n'}$ scores from <u>expected values</u>. Where certain classrooms deviate in terms of expected outputs, they may be scrutinized more closely, individual student histories examined, so as to discover the source of such changes.[2]

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[1]This design resembles what Campbell and Stanley call the "multiple time series design," <u>Ibid.</u>, pp. 55-57.

[2]In the case study, we will work with a very crude version of deviations from predicted values. The necessity of this is explained in a footnote to that discussion, c.f. p. 116.

This ability to look more closely at a process unit's internal dynamics points up another important aspect of accounting design. Output measures $O_{n+1} \ldots O_{n+n'}$ can be examined at a variety of levels. Average unit score is perhaps the least informative level upon which to focus. There is good reason to suppose that the experience of a particular process event will be different both for individual recipient class members and for types of recipient class members. Referring again to educational research, we find an enormous literature suggesting that student types respond differently to proffered educational stimuli. For example, intellectuals, student leaders, and athletes have been presumed to form distinct intra-class sub-cultures.[1] Race and other ethnic characteristics have long been favored categories in the work of educational researchers.[2] Might not these types respond differentially to the experience of a particular classroom? If we look only at deviations from predicted output measures $[O_{n+1}$ - expected $O_{n+1}]$ for a classroom as a whole, we might overlook differential results for these

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[1]See James S. Coleman, The Adolescent Society (New York: The Free Press of Glencoe, 1961) and Burton R. Clark, Educating the Expert Society (San Francisco: Chandler Publishing Company, 1962).

[2]The following is only a small sample of recent educational research which focuses on ethnic differences: Perry A. Zirkel and E. Gnanaraj Moses, "Self Concept and Ethnic Group Membership among Public School Students," American Educational Research Journal, 8, 1971, pp. 253-265; William D. Rohwer, Jr., "Learning, Race, and School Success," Review of Educational Research, 41, 1971, pp. 191-210; Robert W. Heath, "The Ability of White Teachers to Relate to Black Students and to White Students," American Educational Research Journal, 8, 1971, pp. 1-10; Audrey James Schwartz, "A Comparative Study of Values and Achievement: Mexican-American and Anglo Youth," Sociology of Education, 44, 1971, pp. 438-462.

student subclasses. If educationally meaningful sub-classes exist, focusing analysis on the whole classroom cohort will obscure actual classroom effects. In sociology there is a well-established method for dealing with this sort of analytic problem: it involves the elaboration of cross-tabular data according to the various sub-types.[1]

This discussion implies that typological analysis is a general refinement of accounting design. Going back to an earlier remark, we implied that accounting would consist of searching for unexpected post-event scores ($O_{n+1} \ldots O_{n+n'}$) and then probing these further. Such a procedure necessarily glosses over contextual effects relevant only to particular recipient class sub-types so that typological analysis of process units is a logically more powerful method. We wish to establish the principle of typological analysis as a component of process accounting design. In terms of the symbolic schema, this revision results in the following:

$$O_{1'}\ O_{2'} \ldots O_{n'}\quad X_A\quad O_{(n+1)'}\quad O_{(n+2)'} \ldots O_{(n+n')'}$$

$$O_{1''}\ O_{2''} \ldots O_{n''}\quad X_A\quad O_{(n+1)''}\quad O_{(n+2)''} \ldots O_{(n+n')''}$$

$$\vdots$$

$$O_{1'}\ O_{2'} \ldots O_{n'}\quad X_B\quad O_{(n+1)'}\quad O_{(n+2)'} \ldots O_{(n+n')'}$$

$$\vdots$$

etc.[2]

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[1] For an excellent discussion of this method, see Herbert Hyman, Survey Design and Analysis (New York: The Free Press of Glencoe, 1955), especially Chapter Seven.

[2] This diagram is distorted in one respect: it does not symbolize the possibility that the number of observations (pre- or post-event) may vary from one event to another. For example, there may be three pre-event measures for the various X_A subtypes and five pre-event measures for the X_B subtypes.

X_A and X_B are different process events; O_1 to O_n are pre-event measures; $O_{(n+1)}$ to $O_{(n+n')}$ are post-event measures; and the priming outside the subscripts denotes that these measures apply to different recipient class subtypes. Decisions regarding which and how many recipient subclasses to examine would vary with the particular process organization and the budgetary and time constraints imposed on the investigation. In our case study of student grouping, we will elaborate only one of the many possibly relevant subclasses.

Reliance on typological analysis has several important design implications. To provide flexible typologies for classifying recipient class members, the data base is organized in terms of the individual careers of the recipients. Longitudinally-arranged, individual data can then be grouped into typologies of whatever sort the researcher wishes, to the extent that classifying data fields are available. Flexibility in typology construction derives from this arrangement and the computerization of the data which facilitates its manipulation. This data arrangement may be symbolized as follows:

Subject 1: D_1 D_2 D_3 . . . D_n

Subject 2: D_1 D_2 D_3 . . . D_n

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Subject N: D_1 D_2 D_3 . . . D_n

The D's refer to data relevant to the individual and the subscripts suggest time order: D_1 precedes or is contemporaneous with D_2 and so

forth.[1] The data represented here as D's may be of three distinct kinds: background data such as SES, sex, or race; observational data or process measures such as test scores; and process event identification data such as classroom grouping designations in school record analysis. Any D_y of no matter what kind can be the whole or partial basis for a classifying typology with respect to a particular process event D_x subject to the restriction that y precedes x. Accordingly any process measure which falls between two process events may serve as an evaluative measure of the event(s) it follows and as a classificatory dimension of the event(s) it precedes. Also any process event identification may be used as a classifying dimension for the analysis of a subsequent process event. For example, we can consider the differential experience of tenth grade English students in terms of those who took ninth grade Math and those who did not. The longitudinal arrangement of data in terms of the individual careers of recipient class members together with its computerization are fundamental components of process accounting because they permit maximum flexibility in the construction of independent variable descriptors or typologies.

Another significant design gain which process accounting might claim over the simple generic (O_1 X O_2) model relates to the availability of

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[1]The order of precedence referred to here is a logical one which need not influence the actual arrangement of the data on computer tape. For a full discussion of the physical arrangement of data for longitudinal analysis, see Appendix B in David E. Wilder and Alan S. Blumner, Some Sociological Aspects of Student Allocation in Two Racially Mixed Suburban High Schools (New York: Program for Situational Analyses, Teachers College, Columbia University, 1972). See also Appendix A to the present study.

post-event measures of different kinds and proximity to the process event. Normally one expects salient treatments to have immediately observable results yet this common sense expectation has no theoretical underpinning. It is possible that a disastrous classroom experience in ninth grade might permanently lower a student's college aspirations yet have no marked effect on his tenth and eleventh grade letter grade or test record. A general principle of process accounting is that it brings together in a systematic fashion as many different output measures as might relate to the process event. In this way it avoids arbitrary prejudgments as to the sorts of effects linked to a particular process as well as the operant time interval for such effects. The major limits on the selection of measures are again those imposed by time and budget: these force researchers to choose those measures that most plausibly relate to the process unit and ones for which data are economically collected.

As it will be developed in the case study, school record monitoring involves a typological, cross-tabular analysis of group placement. Cross-tabular analysis is not a general requirement of process accounting. For example, a strong case could be made for using a path analysis approach to the problem of determining process effects related to student grouping. For each student in a particular process unit, a prediction line could be plotted in terms of pre-event measures on any goal-related parameter for which at

least two pre-event measures were available.[1] Considering a student's ninth and tenth grade reading scores, we could plot his predicted eleventh grade score, and so for all students in a particular class subject to the data being available on each. The process effects of a student's eleventh grade English classroom experience could then be depicted in terms of the divergence of his actual score from its predicted level.[2] Path analysis also lends itself to a typological procedure wherein the effects of a particular process experience could be gauged separately for different student input types. The preference shown in this paper for cross-tabular analysis reflects the taste of the researcher and his previous experience. As monitoring becomes a more established research procedure, more statistically sophisticated techniques such as path analysis hopefully will be used.

No matter what mode of analysis is employed, the process accounting design depicted in this chapter will be relevant. Its basic features are the

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[1]How this prediction line would be plotted, whether from simple scores or from these scores normalized in terms of class mean scores, is a technical issue that is not relevant to this discussion. What matters is that a methodology exists for making such predictions.

[2]For any given student, this procedure greatly risks falsely attributing to the process event a divergence which may be due to non-school factors. However, the focus of process accounting is always recipient class subtypes and haphazard distortions are likely to balance out for groups of respectable size. Of course, where the effect of an "extraneous" factor holds systematically for an entire subtype, it has the effect of specifying the impact of the process event(s) under study--worthwhile intelligence, if one wishes to know how process events are actually working in an organizational context. On this point, see Hyman, op. cit., pp. 295-311.

interpretation of the process delivery systems in organizations as process events and its location of these events in a longitudinal matrix of process effect measures. In this respect process accounting embodies a positivistic orientation, that the results of organizationally administered process, if any, can be measured.

A rather simple general test of this assertion is possible. Earlier in this chapter, we isolated four obstacles to a valid and useful process measurement system. These were recipient class turnover, contamination of process measures by extraneous factors, the limited scope of process measurement instruments, and the dissociation of process measurement from natural administrative units. To demonstrate the plausibility of process accounting design, we will consider it in terms of these specific impediments.

The ability of process accounting to deal with recipient class turnover depends on several design factors discussed in connection with typology construction--the longitudinal arrangement of individual case data and their computerization. Large capacity computers are able to consider many factors simultaneously so that they can sift through a data file selecting out cases where combinations of pre- and post-event measures are both available. In effect this controls for recipient class turnover by obviating the need to depend on cross-sectional comparisons. Rather than compare the mean input score for a recipient class subtype with the mean output score, we are able to consider just the scores of members on whom both input and output

measures are available.[1] Unexpected output values cannot be attributed to turnover since only measurements of process event "stable" members are taken into account. Drop-outs and drop-ins are for this purpose eliminated from the analysis. If the data base were arranged cross-sectionally, this sort of control would not be possible.

The inclusion of background data on recipient class members provides the basis for controlling the contamination of process measures by external factors. The typological nature of process accounting is also assurance that the effects of external factors will not be attributed wrongly to the process event. Contamination may occur when a process measure is closely related to a non-process event. For example, the college aspiration of high school students has been found to be related to parents' level of education. We might suppose that a class experience led to an increase in student aspiration when this was more plausibly related to the emergent effects of parental education and home influence. To the extent that background data include information about parents' level of education or information closely correlated with this, its effect can be controlled through the construction of appropriate independent variable dimensions in the process accounting. The inclusion of

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[1]This leaves open the possibility that the characteristics of the drop-outs are different for different process events, yet Campbell and Stanley term this "the preferred mode of treatment" with respect to the problem of turnover, (Campbell and Stanley, p. 16). The availability of pre-event observations allows some examination of drop-out characteristics so that major distortions from this source should be discoverable.

background data also permit post hoc examination of interesting findings to see if these findings "disappear" from the cross-tabulations when the background data are taken into account. Post hoc examination is a final check on the attribution of process measures to process events.

By design, process accounting is especially well suited to handle the remaining problems of limited scope of measurement and its dissociation from natural accounting units. The latter is explicitly incorporated in the definition of process accounting--its focus is always natural accounting units. The scope of measurement is a more difficult problem but process accounting attempts to deal with this in the most direct fashion possible, by incorporating as process measures all behavioral dimensions plausibly related to the process event, limited only by time and budgetary constraints. This represents an optimal solution to this problem but does not eliminate it, even apart from practical constraints. People-processing organizations rarely have unambiguous goal structures, a condition which becomes extremely clear if we try to assign weights to various goal dimensions. How, for example, does one judge the relative importance of a student's nervous breakdown set against another student's receipt of a National Merit Scholarship? The inclusion of even a wide range of measures leaves unsolved their interpretation on a basis relative to one another and to the process events studied. The absence of a method for assigning weights to process goal dimensions is possibly the most serious limitation of process accounting as it relates to policy

determination.[1]

School Record Monitoring--A Process Accounting System

This discussion of the logic of process accounting has been conducted at a rather high level of generality. The case study focuses on very specific program features in a single high school. Because of this, it makes use of a somewhat distinctive methodology of its own--one worthy of several general comments.

The major distinguishing characteristic of the case study is its almost exclusive reliance on the institutional records of the school as a data base.[2] For this reason, it has been given the name "school records monitoring." The following are indicative of the kind of data we shall be considering: standardized tests; grouping classifications; letter grades; school attendance; etc. For the most part, these data have been transcribed from official sources

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[1]The problem of assigning weights to different process dimensions requires only a trivial adjustment in the logical design of process accounting, the inclusion of weighting factors for each output or post-event dimension. The central difficulty is not logical but empirical: how and by whom are these weights to be assigned? For an organization to utilize the process accounting system, it would need to establish a weighting system: this would require a thorough elaboration of the organization's goals and agreement as to their relative importance. Quite possibly the meeting of this requirement would be a beneficial activity but it might also prove disruptive in certain organizational settings. How intractable this problem appears depends, perhaps, on one's willingness to accept the structural-functionalist paradigm: that what is (goal ambiguity), is functional.

[2]A major conclusion of the case study analysis is to note the desirability of expanding the data file with student attitude and value measures. The present discussion of the virtue of using institutional records certainly is not intended to downgrade the usefulness of respondent self-reports.

such as permanent record cards. Their "officialness" provides the case study analysis with an added dimension of validity which need not attach to all varieties of process accounting.

The validity of data relates to their reasonableness as proxies for the variables or concepts under study.[1] A common criticism in social science research is that too great an emphasis is placed on questionnaire responses--that these are often poor representatives of the underlying phenomena in which the researchers profess interest.[2] Difficulties characteristic of questionnaires, such as the ambiguity of response categories, tend not to apply to official data. On the other hand, official data are valid to different degrees depending on what concepts they are used to indicate. For example, if I.Q. tests are used to indicate "intelligence," they risk invalidity owing to the dubious fit between the fixed range of the standardized instrument and the general notion of intelligence which our everyday language use embodies.[3] However, if these test scores are used to instantiate the organization's perception of a student's intelligence, these invalidating factors disappear. Because these data are official, they attain a high degree of validity as social facts sui generis. A student is officially

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[1]See Julian L. Simon, Basic Research Methods in Social Science (New York: Random House, 1969), Chapter 14.

[2]Difficulties in developing questionnaires are discussed sympathetically and with gusto in Stanley L. Payne, The Art of Asking Questions (Princeton: Princeton University Press, 1951).

[3]This logical source of invalidity is in addition to the qualifications which reliability tests impose on such standardized instruments.

labeled as "very bright" because his I.Q. score is 125 quite irrespective of technical and logical caveats.

Whatever methodological rigor attaches to school record monitoring beyond the general virtues of process accounting derives from this claim to use data of high validity. The major argument for this claim returns to our earlier analogy of the role of process accounting to that of cost accounting in business. Cost and profit figures are easily accepted as valid measures of business process because they represent what businessmen commonly mean by that process. Likewise grades, grouping data, test scores, and attendance figures are all straightforward elements of school process: outside the context of the school, they may have little meaning but within it they are basic. They are meaningful social facts because the power structure within the organization treats them as such.[1] School record monitoring embodies the perspective of the organization--it deals with manipulatable components of administrative process. For example, monitoring looks at the relationship between test scores and group placement. For this examination to be "meaningful," it is not necessary that the scores represent anything other than numbers to which administrators have access and upon which administrators base grouping decisions. Monitoring is a pragmatic laying bare of relationships among obvious institutional parts.

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[1]This is to say that teachers and administrators generally consider such data indicative of something "meaningful" about the student to whom the data refer. They therefore use these data to formulate processing decisions. Student height is also transcribed on official records but it is not treated as relevant to most processing decisions.

There is a further validating characteristic of institutional records which bears mentioning here. Such data can be collected unobtrusively. Most of the school record data analyzed in the case study were collected from central computerized data files, which were remote from the presence of students. Data collected in this manner are nonreactive: they cannot be merely an embodiment of respondents' reactions to the experience of being observed.[1] School record monitoring takes advantage of the routine nature of student observation by school officials.

Monitoring Design, Explanation, and Theory

Describing process accounting in terms of monitoring design provides no clear picture of the meaning of discrepent or expected output measures. As discussed in this chapter, monitoring is only a systematic means for formulating and validating predictions; it is unconnected with any method for understanding these. The interpretation of particular findings requires an extension of our thinking about monitoring. Whether one wishes to define process accounting narrowly as a system which discovers process effects or more broadly as one which both discovers and explains such effects, the explanation of findings is an important requirement for a full application of process accounting in an organizational setting.

This point emerges if we return again to the often used analogy of

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[1]This point is discussed briefly in Campbell and Stanley (p. 9.) and more extensively in Eugene J. Webb, Donald T. Campbell, Richard D. Schwartz, and Lee Sechrest, Unobtrusive Measures: Nonreactive Research in the Social Sciences (Chicago: Rand McNally and Company, 1966).

process accounting with cost accounting in business. In business, the isolation of a low profit, product line usually has limited policy implications unless attached to an explanatory schema. Elimination of the product line may be appropriate but so may further investment in it. To decide which of these opposite actions is best, a businessman would wish to know why the accounting unit was obtaining the noted results. Likewise in schools an educational administrator should want to know why a particular classroom was producing an unwanted effect before he attempted to revise its organization.

Although we have referred to schools and the design of school record monitoring many times in this chapter, our primary focus has been the general design requirements of a process accounting system. No such general discussion of theory relevant to process explanation can be given. What body of theory is relevant to process accounting depends entirely on the nature of the process events studied. In our case study of student grouping patterns we shall make use of sociological theories concerning contextual effects. This theoretical framework was presented in Chapter Two but it is one that is relevant only for the particular process events to be studied in the succeeding chapters. If the object of our process accounting were psychotherapy sessions rather than classroom groups, a different theoretical base might be required. However, the design of the prediction system, the longitudinal monitoring design itself, would remain exactly the same. This observation sums up what we have accomplished in this chapter.

CHAPTER IV

CASE STUDY: A PROFILE OF STUDENT GROUPS

An overriding objective of this study is to show that the analysis of commonly available school records creates new understandings of what happens to students as they progress through the school program. In the foregoing chapters we considered issues, logic, and theory relative to this endeavor. Now and in the next few chapters we will illustrate this claimed usefulness by analyzing the school program of one particular high school. The subjects of this study are student grouping and grading practices. In this chapter we will precisely define the subject process events and describe the research site and the sample students. The discussions here will be descriptive and in places, highly detailed. Crucial research decisions reflect specific characteristics of the available data, and they can be explained only by detailed reference to the data base.

This case study utilizes particular data to exemplify a general method without championing a special need to understand the chosen research site. We are taking a single case from what is presumably a large universe of equally suitable cases. This assumption inevitably produces distortions since the illustration is in fact derived from a particular school system whose generality to others is moot. And there is no absolute corrective for this condition. As it is, we shall deal with it by devoting the present chapter

to a discussion of the "particularness" of the case study. Similiarly, in Chapter Five, we will discuss the "particularness" of the output measure used in the analysis in the later chapters of this case study.

The uniqueness of Transurbia High School as a research site will become clear as the discussion unfolds, yet its unusual features are not the only limits imposed on the case study. Within the theoretically available research possibilities offered by the Transurbia system, budget limitations, differential accessibility of certain sorts of information, and most importantly, the need to operationalize general concepts with particular data have all shaped the case study into a form which differs somewhat from the general model discussed in Chapter Three. In this and the next chapter we will call attention to these peculiarities.

A preview of the topics to be discussed in this chapter suggests the range of limiting factors tied to the case study approach. First to be discussed is the history of school records research in Transurbia including the basis for site selection and the data collection procedures employed in this study. We will profile Transurbia High School according to both the characteristics of its students and of the community. We shall then discuss student grouping procedures at Transurbia High School and introduce an extensive description of the resulting groups which is included as an appendix to this study. Following this description of the actual groups, we will consider several ways in which these groups may be aggregated to form larger units for analysis.

Looking at particular data raises questions not encountered in the previous theoretical discussion. In a high school which offers hundreds of classroom experiences, which are most worthy of detailed analysis? Is it reasonable to aggregate individual process events so as to increase the base number of students in a particular analytic unit? If so, what criteria should serve as the basis for aggregation? These questions emerge as we attempt to fit a general model of process accounting to data derived from a particular setting. Dealing with these issues extends the theoretical model and thereby paves the way for a more straightforward application of this model to real data.

Finally, much of the discussion in this chapter concerns class groups that we will be unable to analyze intensively in this case study. Process accounting is not a streamlined procedure at this stage of its development. Its demonstration is lengthy even when only several process events are involved. In order that the process accounting in this study maintain as much of the flavor of comprehensiveness as possible, this chapter references and incorporates a description of the major groupings of students over a four year period at Transurbia High School. Thus, while only a subset of these will be "process accounted," the method used to categorize this subsample is applied very broadly in this chapter in order to demonstrate its general applicability. Similarly, in Chapter Five, the output measure described is a general one, although a more specific measure might have been designed to deal with the several process events that are analyzed in Chapter Six.

School Records Research in Transurbia

The case study reported here is a direct outgrowth of earlier school records research conducted by David E. Wilder. In a study of student grouping in Plainfield, New Jersey, Wilder rearranged and coded school records into longitudinal data files in order to study the school careers of a high school class.[1] In that study, Wilder was especially interested in examining the allocation of students by race into different ability groupings. In effect, he was exploring whether such allocations represented a form of de facto segregation.

Shortly after the Plainfield study reached completion, Wilder received an invitation to submit a study proposal from representatives of a special program in the Department of Educational Administration at Teachers College, Columbia University.[2] Several other social scientists had likewise been invited to submit proposals and it had been decided to locate the resulting research projects in Transurbia, apparently as the result of favorable prior research experiences there by members of the Department of Educational Administration. Location and the decision to blend as much general systems theory into each of the separate research endeavors as possible were to be primary unifying elements.

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[1] Anderson, William P. (dir.), Grouping Students for Instruction in the Plainfield, New Jersey School System (New York: Institute of Field Studies, Teachers College, Columbia University, 1969), pp. 75-102.

[2] Program for Educational Leadership (PEL) whose federally funded research component was called the Program for Situational Analyses.

Wilder saw the Transurbia research as a chance to extend and refine his school records approach. Of equal importance, the mixed racial composition of the Transurbia system offered the prospect of further exploring questions of student allocation to class groups and de facto segregation.[1]

Transurbia is a small northeastern city which adjoins a much larger metropolis. In the past twenty years its population has diminished from eighty thousand to seventy-five thousand residents. At the same time, the percent of blacks living in Transurbia has increased from 11% to 45%. Up till 1960, most of the black newcomers tended to be relatively well-to-do. Moving to Transurbia signified a social ascent from poorer neighborhoods in the adjacent city. By the late 1960's this pattern had altered and many blacks were discovering that Transurbia offered alternative but not conspicuously better housing arrangements. The great on-rush of black immigres in the late '60's tended to be lower in socioeconomic status than their predecessors. A higher percentage were families in which no adult male was present.

Attendance in the public school system amplified residence patterns since many whites who remained in Transurbia transferred their children to private and parochial schools. In Table 4.1, the percent of blacks in three class cohorts at both of the public high schools is presented. A class cohort group consists of all students ever participating in that class during the four

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[1]See Wilder's original Transurbia research proposal in David E. Wilder and Alan S. Blumner, Some Sociological Aspects of Student Allocation in Two Racially Mixed Suburban High Schools (New York: Program for Situational Analyses, Teachers College, Columbia University, 1972), pp. 115-119.

high school years. In addition to showing a pattern of increased black attendance at both schools, this table rather dramatically underscores one of the central characteristics of the Transurbia system. The smaller School B had a predominantly white student body while the larger school's students were mostly black. This reflects a traditional American custom of basing school attendance on residence district rather than a policy of overt discrimination. School B is located at the far edge of the city in the prime residential area and School A is located in the center of the city.

TABLE 4.1

PERCENT BLACK STUDENTS IN THREE SCHOOL CLASS COHORTS AT BOTH TRANSURBIA PUBLIC HIGH SCHOOLS

	School A	School B
*Class of 1965:	67% (689)	11% (257)
Class of 1969:	88% (745)	19% (257)
Class of 1970:	95% (754)	24% (221)

*The percentage and base numbers in Tables 4.1 and 4.2 derive from the original Transurbia research which utilized a sampling frame based on the attendance ledgers. See Appendix A for a discussion of how this differs from the sampling frame used in this case study.

Aware that questions of racial balance were of great importance to the school system, Wilder proposed to examine the internal allocation or grouping systems of the two high schools, focusing special attention on the differential status of white and black students. This researcher was hired as

Project Associate for this study which began in the fall of 1969. A detailed chronicle of this research is available elsewhere.[1] Briefly, it relates difficulties in securing needed information which resulted in a reformulation of the original study design. The research report focuses on the Class of 1970; it does not stress patterns of de facto segregation resulting from the school's internal groupings but rather calls attention to certain apparent inequalities in the ability grouping system of the larger School A as well as certain anomalies in the perceptions of '70 seniors concerning the schools and their own academic orientations.[2] Of particular importance was the discovery that black students appeared to reject academic sanctions of grades in formulating their own college plans whereas white students appeared to respond in traditional ways. Consistent with this, blacks were found to aspire to college more frequently than whites though their grades tended to be lower as did their standardized test scores.

This study is a continuation of that research under the independent sponsorship of a United States Office of Education small project grant. As originally proposed, this study was to double the student sample by processing data for the Class of 1969 and also to collect post high school career information. Only the former proved feasible given the limitations of budget. Furthermore, difficulties in securing full cooperation at School B forced the researcher to restrict analysis to School A, a modification which led directly

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[1] See Wilder and Blumner, op. cit., pp. 93-105.

[2] Ibid., pp. 60-87.

to the focus of the case study on this school's ability grouping system.

For the present study, the sample consists basically of the Classes of 1969 and 1970 at School A which will be called Transurbia High School. The presence of a small number of white students makes it impossible to control for race while also controlling for other independent variables such as ability, SES, etc. White students were distinctly in a minority: Table 4.1 shows that they constituted less than ten percent of the combined '69 and '70 classes. In no single classroom setting did they outnumber the blacks. Since it would be impossible to study the small group of white students separately with cross-tabular methods, and equally impossible to control for race were they to be included in the analysis, they have been eliminated from the sample in all respects but one. In a later section of this chapter profiles of classrooms are discussed as they appear in Appendix B. For purposes of characterizing class settings only, white students are included in the case study. This exception is allowed because their presence does in reality alter the letter grade distribution of classes as well as their ability levels. To eliminate the whites from the classroom characterizations would impose an avoidable distortion since their presence may well alter the nature of the experience provided their black classmates. The case study then concerns the experiences of black students in classroom contexts in which they predominate.[1]

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[1]Also excluded, of course, are those students on whom school records data were not available. Generally such students were present less than one full year. Their affect on the remaining students and the school's affect on them must be supposed minimal. Perhaps as many as 75 black students in each class have been excluded for lack of data. See Appendix A for a discussion of the sources of student grouping information.

Students at Transurbia High School (School A) are grouped by curriculum. In ninth grade, curriculum distinctions are somewhat fluid thereby allowing students opportunity to define iheir own academic aspirations. However, by tenth grade, all students are sorted into one of three formal curricula which tends to limit subsequent course selection alternatives. The College Preparatory (CP) curriculum features academic courses in English, math, foreign languages, science, and social studies; the General (Gen) curriculum offers basic skill type courses in English and social studies; the Business (Bus) curriculum provides several areas of concentration including clerical, sales, secretarial, and bookkeeping training.

Classes in major subjects at Transurbia High School are grouped by ability within curricula so that their composition is likely to be relatively uniform in academic aptitude. We shall refer to these official Transurbia grouping arrangements as "tracks," although strictly speaking Transurbia's is not a tracking system. Students assigned to a high ability English section within the CP curriculum need not be assigned to a high ability math section; allocation to ability groupings within curricula is at least nominally independent in each subject area. Overall students in the CP program tend to be of far higher measured ability than their peers in the other programs which results in lower ability CP sections being of comparable ability to the highest ability non-CP sections. The case study analysis does not focus on the formal curriculum distinctions but rather on ability grouping generally since it would be difficult to control for the formal distinctions and ability grouping given a rather limited sample size.

Table 4.2 shows the percentages of Transurbia students in each of the high school curricula for the Classes of 1965, 1969, and 1970. This table points up the relative and increasing importance of the College Preparatory curriculum which enrolled more than half of the Class of 1970. The unevenness of the distribution of students to these three groups led to the decision to focus the case study analysis on other characteristics of classroom groups such as ability level rather than formal curriculum divisions. Reinforcing this decision was the fact that boys predominate in the General curriculum, girls in the Business curriculum, while the College Preparatory program is evenly mixed.

TABLE 4.2

PERCENT OF STUDENTS IN THREE SCHOOL CLASS COHORTS ENROLLED IN EACH CURRICULUM AT TRANSURBIA HIGH SCHOOL

	Classes		
Curricula:	1965	1969	1970
*College Preparatory:	44	46	51
General:	35	33	27
Business:	21	20	23
	100%	99%	101%
**	(574)	(666)	(576)

*See note to Table 4.1 above.

**Students on whom curriculum assignment was uncertain have been eliminated from this table. White students are included.

The Sample of Groups

In this section we are going to examine a variety of issues related to the academic program at Transurbia High School in order to further explain the selection of particular process events for the case study analysis. Like most comprehensive high schools in America, Transurbia utilizes school classrooms as their predominant modality for educational "treatments." The large number of classrooms available to the sample students throughout their careers constrained the researcher to select a subsample for detailed analysis. For one school class in one year at Transurbia High, there are possibly 200 distinct classroom experiences in which a student might participate. Nor is participation in academic classes limited to the student's own grade level. Though unusual, a junior might take a sophomore or a senior level course. If all the separate classrooms which enrolled at least one 1970 junior during the 1968-1969 school year were calculated, we would probably find as many as 500. This is a staggering total for it implies that data should be assembled on each student in each of these classes in order to characterize each according to the schema of process accounting in this case study.[1] Such an analysis would go beyond the scope of the present, pilot-type study.

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[1] Classrooms are going to be characterized according to an estimate of their ability level and according to the distribution of letter grades. These represent what Lazarsfeld has termed "analytic properties" of groups since these descriptions are based upon the properties of the individual members. See Paul F. Lazarsfeld, "Evidence and Inference in Social Research," Daedalus, 87, 1958, pp. 99-130.

A number of practical decisions were made as part of the case study. One of the earliest of these was to exclude from study most courses taken by students which were not "at" their grade level. The importance of this exclusion varies quite a bit by subject matter. In terms of the school's English program, it is trivial since very few students took an English course below or above their own grade level. At the same time, this decision makes it virtually impossible to monitor the school's language program since many students who took a foreign language at Transurbia High enrolled in sections at grade levels below their own. Because it will help demonstrate the methods employed in the case study, we will examine this decision further.

The basis for excluding off-grade level courses from analysis relates to the way we characterize classroom units which are analyzed. Classes are defined by the properties of their students. In order to assign classrooms values on the resulting independent variables, it is necessary to have information on each student member of the class, or at least on a large percentage of its students. Therefore when a sample student takes a language course below his grade level, in which most of his classroom peers are non-sample students, he is participating in a process event for which we have not collected an adequate amount of defining information.[1]

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[1]An exception here concerns Class of '69 students taking Class of '70 courses. For these students it would have been possible to explore the classroom contexts into which they were assigned. To do so, however, would have required quite a few special rearrangements of data in order to integrate data fields located in separate data files. The exploratory nature of the present study did not seem to require such thoroughness. For a detailed description of the data file arrangement, see Appendix A.

A related limitation of this approach is that it is impossible to ascertain with complete certainty the actual distribution of student characteristics for classes which are at proper grade levels since the data collection procedures have excluded some students who participated in these process events. For example, the characteristics of a Class of '68 sophomore taking a freshman or Class of '69 English course would not affect the description of that classroom context since his presence is unknown, i.e. no data were processed on members of the Class of 1968. However, resulting distortion in the assignment of proper grade level courses to categories on the context-descriptive variables is assumed minimal since data on the '69 and '70 students indicate that off-year course selection is rare and does not tend to cluster in particular classrooms. The presence of several non-sample students in a class of twenty-five students would not likely alter the nature of class context, determined by the aggregate characteristics of its members.

Before examining class contexts in detail, a second decision to eliminate certain classes from study should be pointed out. Only classes in the academic program which met five class periods a week, so-called major subjects, have been included in the case study. These criteria eliminated from study many elective courses, e.g. music and art, as well as some specialized, major-type courses such as Business Accounting. The rationale for these further exclusions does not relate to the absence of data but rather to the need to simplify data processing and more importantly, to focus analysis on those courses most likely to have salient effects and those in which the greatest number of students were likely to have participated.

Major subject areas at Transurbia High School consisted of the following: English, math, foreign languages, science, and social studies. Not all students took a course in each of these areas each year. Table 4.3 shows the percentage of students who took major courses for each subject area broken down by school class and school year. It also shows these data discounting students who took these courses not at grade level. Comparing these figures, we see that foreign language and math courses were much more likely than other subject areas to have been taken "off" grade level. This implies, of course, that a greater percentage of nonsample students participated in the grade level courses given in these areas. Partly for this reason, the analysis of student groups in Chapters Six and Seven does not focus on these subject areas.

In Appendix B individual student data are used to characterize each major, grade level class for the '69 and '70 cohort groups. Three distinct kinds of student data are assembled on each classroom group: course grades, attendance, and standardized tests. In all instances, the class means of several standardized tests are presented and where possible, these tests include some administered prior to the course and some administered during the academic year of the course. In grades nine through eleven, the distribution of final course grades are presented whereas the third of six marking period grades is utilized in the senior year profiles.[1]

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[1]Final grades were not available for the Class of '70 seniors at the time of data collection and the researcher felt that the earlier grades might be a better indication of senior performance since college admission practices tend to foster a "slump" in the latter half of that academic year. Where available, prior year and same year absence means are presented on the sample classes.

TABLE 4.3

PERCENT OF ALL CLASS OF 1969 AND 1970 STUDENTS TAKING MAJOR SUBJECT COURSES DURING FOUR ACADEMIC YEARS, REGARDLESS OF GRADE LEVEL OF COURSE AND "AT" GRADE LEVEL ONLY

	Class of 1969				Class of 1970			
	9	10	11	12	9	10	11	12
English*:	99%	96%	93%	99%	99%	99%	99%	99%
English**:	98%	88%	85%	96%	97%	91%	88%	96%
Foreign Lang.*:	62%	61%	40%	22%	65%	59%	36%	17%
Foreign Lang.**:	61%	48%	17%	6%	65%	45%	14%	2%
Math*:	73%	65%	59%	69%	74%	70%	66%	64%
Math**:	73%	48%	26%	21%	74%	49%	32%	22%
Science*:	81%	77%	26%	46%	72%	79%	29%	47%
Science**:	81%	74%	18%	42%	70%	76%	21%	40%
Social Stud.*:	31%	26%	92%	98%	36%	28%	98%	97%
Social Stud.**:	29%	22%	87%	93%	33%	20%	94%	89%
	(532)	(514)	(487)	(486)	(532)	(502)	(494)	(471)

*Indicates that course was taken in this subject area regardless of its particular grade level.

**Indicates that course was taken in this subject area at the student's current grade level, e.g. a ninth grader who took ninth grade English rather than one who took tenth grade English.

Table 4.4, abstracted from Appendix B, illustrates the extensive description of class contexts to be found there. Profiles of five, Class of '69, sophomore English classes are presented; five hundred and ninety-one additional profiles, similar in format, are presented in Appendix B. Reading Table 4.4 from the top down, the first feature to note is that each class is labeled by curriculum--whether it is College Preparatory (CP), General (Gen), or Business (Bus). On the next line of the table is the class I.D. number, which signifies several things about the class. The first digit (in Table 4.4 all are 2's) indicates the year level of the course.[1] The second digit of the I.D. number signifies the official ability level or track of the course. The remaining digit(s) represents the section number, arbitrarily assigned within tracks. Thus English class 213 is the third section of the first track of the sophomore English program. Similarly, in Appendix B, science course 1211 is the eleventh section of the second track of freshman science. Continuing to read down the columns in Table 4.4, we find the letter grade distribution of the five classes. For precision, the actual frequency is presented rather than percentages. Next are the absence rate means for the ninth and tenth grade years.[2] Below these are the class means

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[1] In Appendix B, off-year courses have been included only where sample student enrollment was comparable to at-year classes in that field. This occurred occasionally in foreign languages and math.

[2] These variables are calculated in the following way: when a student attended a full year, his absence rate is simply the sum of each marking period's absences. When a student attended fewer than the full six marking periods but more than one, his absences are totaled, then multiplied by a proportional factor to obtain the best estimate of his attendance on a full year basis.

TABLE 4.4

PROFILES OF FIVE CLASS OF 1969 SOPHOMORE ENGLISH CLASSES, ABSTRACTED FROM APPENDIX B

	CP 213	CP 221	CP 232	GEN 264	GEN 271
*EngGr10:					
A	2	1	2	1	-
B	7	14	5	8	-
C	6	8	10	3	2
D	3	2	4	2	6
E	-	-	1	-	2
	(18)	(25)	(22)	(14)	(10)
*AB09:	10	7	9	12	12
*AB10:	12	13	11	24	19
*RD09:	12	10	9	8	6
*RD10:	13	10	9	9	7
*LS09:	80	56	43	38	16
*MS09:	69	50	43	21	14
Grade Context:	1	1	2	1	3
Ability Context:	1	2	3	4	5

*See preliminary note to Appendix B for an explanation of the abbreviations used in this table.

on four standardized tests. The first two indicate levels of general reading skills in grade-equivalents so that the number "12" in the first column means that the average ninth grade reading score for class 213 was twelfth grade level. The other two are language and math aptitude scores reported as percentile means based on national norms. The average score in class 213 on the language component of the SCAT (school and college ability test) was at the 80th percentile nationally. The standardized test score means associated with each class were used to assign that class a value ranging from one to five on the Ability Context variable which is shown in the final row of Table 4.4. This observation leads us to consider how and why assignments to context-descriptive variables were made.

Context Descriptors

The criteria used to assign class groups values on the context variables are fairly straightforward as is the need to develop variables of this sort. Assignment of the three-valued Grading Context descriptor was predicated on precise formula:

(1) If one-third or more of the class's students received an A or a B and this number exceeded the number obtaining a D or an E, the class was considered to be "high-graded" and given the value one.

(2) If one-half or more of the students received a D or an E the class was considered "low-graded" and given the value three unless an equal number of students received an A or B.

(3) If the class was neither high nor low graded, it was considered middle-graded and assigned the value two.

Assignment to the Ability Context descriptor was more judgmental, being the

result of the researcher's summary impression of its standardized tests.[1] The values for this variable represent the following:

(1) Value One: substantially higher than the modal ability level for other class sections at that grade level;

(2) Value Two: above the modal ability level for class sections at that grade level;

(3) Value Three: average or about average ability;

(4) Value Four: below average ability but within reach;

(5) Value Five: substantially below the modal ability level for classes at that grade level.

The essential function of these context descriptors is to permit class units to be aggregated and thereby to enlarge the number of participants or subjects for analysis.

As an example, these variables allow us to examine the effects of participation in high ability English sections, an aggregate process event with several hundred students instead of separately examining a dozen smaller process events at the classroom level. The advantage of analyzing larger units is that a greater number of independent variables may be explored simultaneously. The cost of this maneuver is that it appears to violate our earlier commitment to the analysis of natural units which, of course, are the individual classes. At that time we observed that the usual unit of analysis in school evaluation--the school class--is inappropriate because it is non-manipulatable part of the

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[1]Note that it would have been awkward to use the official ability track designations to categorize classrooms into ability units. Track designations apply within curriculum groupings and thus do not follow a consistent sequential order with respect to absolute ability.

school program. Significantly, this is not true of ability or grading contexts since both may be altered administratively with relative ease.

The choice of grading and ability contexts relates directly to the discussion of reference group theory in Chapter Two. Notwithstanding the possibility that other dimensions of context may be highly significant, selection of these two follows from the summarizing conclusion of that discussion--that students acquire norms for behavior and self-evaluation from their immediate peers. It is plausible to assume that a student's perception of his ability will stem in part from his evaluation of the ability of his classmates and likewise that his "reaction" to a low grade may depend on the relative frequency with which low grades are assigned in his class. If everyone in a class is failing French the stigma of failure is likely to be attenuated. The choice of these two dimensions of class group structure for detailed exploration recognizes the potential saliency of reference group behavior as well as the limits of the case study method, that only a subset of the possible group influences can receive detailed analysis.

The issue of aggregation represents a fundamental extension of the process accounting methodology. It commits us to explore certain kinds of possible effects and to ignore others. Specifically we are positing that the ability level of the class group will affect the behavior of its participants as will the distribution of grades to its students in ways which are distinct from the individual attributes of obtaining a high grade or being of high ability. We are suggesting that there may be something operative about grading and grouping contexts per se. If the prime determinent of the impact

of a particular classroom is the skill of its teacher and this factor is unrelated to either grading or ability levels, analysis of the latter dimensions will fail to discover grouping effects.

We will explore the theoretical significance of the context descriptors in Chapter Six but some additional clarification of their status is appropriate here. The inter-relationship between the two context descriptors is presented in Table 4.5, the marginals of which show the frequency of each separate classroom context. Looking just at the marginals, we observe that 26% of the 596 classes are high-graded, 36% mid-graded, and 39% low-graded. Similarly, 6% are highest ability, 23% are above average ability, 34% average, 22% below average, and 15% lowest ability.

The grading descriptor marginals are extremely interesting. They indicate that in almost four out of every ten major subject classes, fifty percent or more of the students received very low grades. Evidently the grading curve at Transurbia High School is rather severe. In the case study analysis and the construction of the output measure, letter grades will occupy a conspicuous role.

Looking at the absolute frequencies in the fifteen cells of Table 4.5, it is apparent that grading and ability contexts are strongly related--that high ability contexts tend to be high-graded whereas low ability contexts tend to be low-graded. Despite this, it is also clear that many contexts exist in which the usual conjoint patterns of grading and ability do not occur. The frequency of these "deviant" contexts suggests that it may be possible to explore the effects of grading and ability contexts simultaneously.

TABLE 4.5

OVERALL RELATIONSHIP IN ABSOLUTE FREQUENCIES OF ABILITY AND GRADING CONTEXT DESCRIPTORS AMONG 596 SAMPLE CLASSROOMS

	Ability Context: Highest 1	2	3	4	Lowest 5		
Grading Context:							
Hi-Graded 1:	29	51	35	23	14	(152)	26%
Mid-Graded 2:	5	56	84	40	28	(213)	36%
Lo-Graded 3:	-	29	86	71	45	(231)	39%
	(34)	(136)	(205)	(134)	(87)	(596)	
	6%	23%	34%	22%	15%	100%	

One further point on the general topic of the relationship between classroom characteristics merits attention. Referring to Appendix B, examining the absence means of classrooms in conjunction with their ability levels, we find a very strong relationship: high ability contexts tend to receive relatively low absence rate students and these low absence rates tend to be continued during the school year, and low ability sections tend to receive high absence rate students who maintain their high rates of absences during the school year. This points to a problem that has no resolution: though we hope to focus on varying ability contexts in Chapters Six and Seven we shall be examining absence contexts which often vary in lockstep. Since it will be impossible to separate out the differential impact of absence and ability contexts, we must

take pains to keep their close inter-connectedness in mind when we seek to interpret findings related to ability context.

Selection of a Subsample of Groups for Process Accounting

In this chapter and in several appendices related to it we have described the research site and the grouping and grading practices found there. While these practices constitute the general subject matter for this case study, it would not help illustrate process accounting to analyze all of them. Even when the classrooms are categorized as values on the context descriptors, they remain too numerous for detailed investigation here. For this reason, a subset of the five hundred and ninety-six classrooms profiled in Appendix B has been selected for intensive analysis.

Two factors have influenced this selection. The first pertains to the interrelationship of ability group placement in the various major subject areas. This interrelationship poses a methodological problem but it also helps justify a focus that is limited to one particular subject area, which is classroom groupings in English. Ability level assignment in English correlates highly with such assignments in other subject areas. To see the kind of problem this poses, we might consider an extreme hypothetical example of the inter-relatedness of subject area grouping--a school in which each classroom cohort remains together for all courses. Under this circumstance it would be quite possible to examine the effects of student grouping generally but impossible to separate the effects of grouping in English from those of grouping in math. On the other hand, in a school in which ability level assignments in different

subject areas are completely unrelated, it would be fairly simple to explore the effects of grouping in each subject area separately while difficult to explore ability grouping in general. Because the situation at Transurbia fits neither extreme, it requires close attention.

The actual interrelationship between ability level placement in English and the other subjects is fully presented in Appendix C. It shows a tendency for students in extreme categories of ability in English to be in similar ability settings in other subjects. At the same time, students in middle ability sections in English frequently participate in high and low ability sections of other subjects. The overall pattern is probably closer to the first hypothetical situation of perfect interdependent tracking among the various ability groups than to the complete independence pattern but sufficiently different to make generalizations from English groupings to general ability placement dubious.

An arbitrary decision has been made to focus the case study analysis on English grouping since this is the most widely taken and perhaps most basic subject offered at Transurbia High School. In doing this we must risk that effects attributed to particular English groupings stem partly from participation in certain ability groupings generally. But this risk also carries a beneficial implication. It suggests that English ability grouping is something of a proxy for the other ability groupings so that what we analyze may be a more salient feature of the school program than simply a course which meets less than an hour each school day. Since our aim is to demonstrate a methodology for discovering and explaining the effects of group participation, we shall certainly wish to focus on groupings most likely to "show" effects. For even if we are unable

to precisely explicate the causal chain which leads to a discovered finding, we may still demonstrate the pattern of reasoning that is characteristic of process accounting.

The distribution of students in Table 4.6 may be used to point up the second factor which has narrowed the focus of the case study to an analysis of effects associated with the ninth grade English program. Table 4.6 profiles the Classes of 1969 and 1970 cohort groups in terms of the duration and the sequencing of their Transurbia High careers. Careers are categorized into three general groups: "stables" are those students who remain without interruption at least to twelfth grade, regardless of their year of entry; "dropouts" are students who depart prior to twelfth grade, having been stable prior to their departure; "unstables" are those students whose careers are interrupted for at least one year of the freshman to senior sequence.[1] This latter group is very small; it represents more of a logical possibility than a significant career pattern. Referring then to Table 4.6, the sample for intensive analysis consists of those students on lines 1, 5, 6, 7, 11, 12, 13, and

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[1]It must be stressed that this terminology refers specifically to the careers of the Transurbia students in the study's sample. Thus the category "dropouts" includes students who transfer to a different school as well as students who are "left back" a grade and continue their education at Transurbia High School. Data were not reliably present on graduation for the Class of 1970, hence the possibility of senior year dropouts is not entertained. This is less distorting than it might appear since many "late" dropouts at Transurbia continue their education at night school. Similarly, Table 4.6 does not differentiate transfer-outs and "left-backs" from dropouts, again because reliable data were not available. Table 4.6 is merely a general description of the duration and sequence of student attendance in the cohort groups.

14.[1] These total to 79% of the Class of 1969 black students and 76% of the Class of 1970 blacks, altogether 77% of the target sample. Table 4.6 calls attention to an important characteristic of class cohort analysis--that membership in a school class changes over a four year period. Clearly our strategy for studying the experience of a school class cohort must take into account the nature of student turnover characteristic of this group.

Underlying the exclusion of students who enter Transurbia High School subsequent to ninth grade is, of course, the paramount need to curtail the scope of the case study analysis. Beyond this there is research which suggests that the initial experience of an educational setting may be critical and ninth

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[1]Though we have thoroughly defined the set of students to be examined in the case study, the fact that the unit of analysis is to be student groups raises additional complications. We will be studying the effects of participation in ninth grade English sections. If a sample student participates in two English courses during his ninth grade year, which course are we to count? Since we are interested in discovering the impact of the freshman English program, the obviously correct procedure would be to study both course experiences. This presents us with an odd methodological problem--one which does not normally occur in survey analysis which is the patent for process accounting. If a student may legitimately be counted twice in the analysis of freshman English, how are we to arrange the data so as to have an effective sample size in excess of the number of students in the sample itself?

Without going deeply into the technicalities of this matter which are discussed in Appendix A, several general comments are in order. The problem of multiple enrollment by a single student in several courses of the same kind was ignored in previous Transurbia research by the arbitrary device of selecting out one course for inclusion in the data file. Because a purpose of the present research was to refine monitoring methods and to make them more comprehensive, this expedient was proscribed. Instead a refined sampling procedure was devised which allows a student to be counted twice if he participates in two grouping sections. Importantly, if both sections are low ability groups and we decide to analyze low ability groups as an aggregate unit, the same student is counted twice in the base number of participants. See Appendix A for details of the data arrangement which makes this manipulation possible.

TABLE 4.6

DURATION AND SEQUENCE OF TRANSURBIA HIGH SCHOOL CAREERS FOR THE CLASSES OF 1969 AND 1970, BLACKS ONLY

Line #		Class of 1969	Class of 1970	Total
1.	STABLE, Gr 9, 10, 11, 12:	57.9	50.0	53.7
2.	STABLE, Gr 10, 11, 12:	5.2	5.5	5.3
3.	STABLE, Gr 11, 12:	4.0	4.9	4.4
4.	STABLE, Gr 12:	5.4	6.7	6.1
5.	DROPOUT, Gr 9:	10.0	11.6	10.9
6.	DROPOUT, Gr 9, 10:	5.4	6.9	6.2
7.	DROPOUT, Gr 9, 10, 11:	3.3	6.1	4.8
8.	DROPOUT, Gr 10:	3.3	2.7	3.0
9.	DROPOUT, Gr 10, 11:	1.0	1.1	1.1
10.	DROPOUT, Gr 11:	2.8	3.4	3.1
11.	UNSTABLE, Gr 9, 11:	0.2	0.3	0.2
12.	UNSTABLE, Gr 9, 11, 12:	-	0.5	0.2
13.	UNSTABLE, Gr 9, 12:	0.3	0.3	0.3
14.	UNSTABLE, Gr 9, 10, 12:	1.6	0.2	0.8
		100%	100%	100%
		(579)	(656)	(1235)

grade classes best represent this condition.[1] Also, Table 4.6 shows that the cohort groups are largest in the ninth grade so that any later subsample would involve the use of a smaller sample.

Having reduced the focus of the case study to the freshman English program, we must now reexamine the context descriptors described earlier for the complete sample of student groups at Transurbia High School. The issue here is whether ability and letter grading contexts are sufficiently independent of one another to permit an examination of their separate effects in the case study analysis. Table 4.7 presents the inter-relationship between ability and grading contexts for the ninth grade English program. As with Table 4.5, if we examine the marginals we find the relative frequency of each context category. Twenty-four percent of the English sections are high-graded; 38% are mid-graded and an equal percent low-graded. This contrasts with 2% highest ability, 16% above average, 29% average, 36% below average, and 18% of lowest ability. Looking just at the cells of Table 4.7, and comparing these with Table 4.5, we observe a less strong tendency for high-graded, high ability contexts to be co-joined. Indeed if we dichotomize these two contextual variables so that upper ability ranges from one to three on the ability descriptor and high-graded consists of one and two on the grading descriptor, the relationship between ability and grading context appears somewhat attenuated. As Table 4.8 demonstrates, conceived as dichotomous, and specified for the ninth grade English program

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[1]See Walter L. Wallace, Student Culture: Social Structure and Continuity in a Liberal Arts College (Chicago: Aldine Publishing Company, 1966).

TABLE 4.7

RELATIONSHIP IN ABSOLUTE FREQUENCIES OF ABILITY AND GRADING CONTEXT AMONG 45 FRESHMAN ENGLISH SECTIONS

	Ability Context: Highest 1	2	3	4	Lowest 5		
Grading Context:							
Hi-Graded 1:	1	4	-	5	1	(11)	24%
Mid-Graded 2:	-	2	8	3	4	(17)	38%
Lo-Graded 3:	-	1	5	8	3	(17)	38%
	(1)	(7)	(13)	(16)	(8)	(45)	
	2%	16%	29%	36%	18%	100%	

TABLE 4.8

RELATIONSHIP IN ABSOLUTE FREQUENCIES OF DICHOTOMIZED ABILITY AND GRADING CONTEXT DESCRIPTORS AMONG 45 FRESHMAN ENGLISH SECTIONS

	Ability Context: High	Low		
Grading Context:				
High:	15	13	(28)	62%
Low:	6	11	(17)	38%
	(21)	(24)	(45)	
	47%	53%	100%	

at Transurbia High School, ability and grading contexts appear to be largely independent of one another. This condition provides the justification for treating these context descriptors as independent in the case study analysis in Chapter Six.

It is clear from the discussion in this chapter that our case study analysis will concern the effects of ability grouping and letter grading in the ninth grade English program at Transurbia High School. Many other group contexts might have been selected but the ninth grade English program offers the best single vantage for demonstrating process accounting.

CHAPTER V

CASE STUDY: THE OUTPUT MEASURE

Any study which pretends to assess the effects of institutional arrangements requires the use of some evaluative-type measures. What we need are measures of "goodness." From a research standpoint, the choice of measures is analogous to the relationship between concept and indicator. The concept, of course, is that the particular feature is "doing well," is "working," or "is good," and the problem becomes that of selecting appropriate measurable dimensions. These choices are crucial. If we maintain that a particular program is doing well because it relates to certain measures and these measures are not sensibly indicative of what we mean by "doing well," our evaluative efforts will necessarily be futile.

The Academic Identification Typology

In this study the possibilities for output measures have been severely circumscribed by the kinds of available data. Attitude and self-image reports were available on some Class of 1970 Seniors but difficulties in the administration of the questionnaire resulted in a distribution of respondents that was skewed toward the higher attending and achieving students.[1] For this reason it was decided to search the school records file for output measures that

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[1] c.f. Appendix A.

would apply to all students in the sample.[1] The result of this search is a single measure that is broad in concept but rather limited in definition.[2]

In the school records three kinds of data appear to be possible candidates for inclusion in an output measure--standardized tests, school attendance, and letter grades. Standardized tests require the use of a procedure to control for initial levels of ability, knowledge, or skill. Given the rate of student turnover (c.f. Table 4.6) and "missing information," the use of such tests would result in the systematic elimination of very marginal students from analysis. They are the very subjects we are most eager to study! For this reason, no attempt was made to construct an output measure involving these tests. Likewise, the use of school attendance information requires great caution since attendance clearly is an indication of physical malaise as well as dissatisfaction. These considerations prompted the use of letter grades as the central component of the output measure.

Concerning the substantive import of the output measure, what do a student's grades tell us about his overall adaptation in school? We have already observed the peculiar, low distribution of grades at Transurbia High

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[1]Once again, the desire to be comprehensive was a factor here. The selection of ninth grade English as the subject for intensive case study analysis evolved after considerable preliminary analysis. It was highly desirable to have an output measure which could be applied to the analysis of a variety of independent variables and one which would not sacrifice unnecessarily any particular segment of the sample.

[2]The use of a single output measure contrasts with the claim in Chapter Three that process accounting incorporates a variety of output measures. In essence, we will make use of only one post-event measure in our analysis. The fault here lies with the resources available to the case study, not with the logic of process accounting.

School so that it seems reasonable to suppose that high grades are never awarded casually. It is likely that in a great majority of cases, a student who acquires an "A" or a "B" in a major subject has expended effort toward that result. Let us interpret this effort as indicative of strong academic identification.[1] Thus all students acquiring high grades in a major subject at the end of their Transurbia careers, will be placed in the "Academic Identifier" category of the output measure.[2]

What then about students who also try to succeed, yet fail to acquire an "A" or "B"? Are not these students also academic identifiers? Perhaps they fail to obtain a high grade only because they are less gifted. On this point there is evidence if we are willing to assume that school attendance is also indicative of effort and academic identification. In Table 5.1 we may compare students in the top and bottom quartiles of language aptitude

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[1]This interpretation constitutes a fundamental assumption in the construction of the output measure. One might argue, though it seems to this researcher far less plausible, that high grades are merely indicative of fear of parental retribution.. The data file is insufficient to substantiate either assumption.

[2]As will be explained shortly, students who attended Transurbia High School for only one year are assigned to separate categories on the output measure. Thus for purposes of calculating the output measure, a student's ninth grade year's grades are irrelevant. For the other years, the "major" subjects whose grades were examined varied: for students departing after tenth grade, letter grades in science and English were relevant; after eleventh and twelfth grades, letter grades in social studies and English were counted. Letter grades in other major subjects were not scored for this purpose because enrollments in them varied and tended to favor students in the College Preparatory program. In order to minimize bias, only subject areas with extensive enrollments were used. See Table 4.3 for a description of the enrollments by grade year and subject area.

with respect to their rates of school attendance as indicated by the percent in the highest absences' half of the school class for any given school year. By controlling for letter grade received in English, we are able to see if the less able students receiving a "C" appear to have tried as hard as their more able peers who received the same grade. Looking at the bottom line of Table 5.1, which totals the experiences of the four years for the combined sample classes, we find that 42% of the low ability students who obtained a "C" in English had high absences in contrast to only 25% of the high ability students. These data appear to justify limiting membership in the Academic Identifier category of the output measure to students obtaining high grades only. Also, looking more generally at Table 5.1, we find a strong positive correlation between high grades and low attendance at both levels of ability.

"Academic Identifiers" are students who receive high grades in a major subject their final year unless they attended Transurbia High School for only one year. This last restriction relates to our interest in letter grades as an independent variable. In the analysis which follows this chapter, we will be treating students' letter grades in freshman English as educational treatments in the fashion of process accounting described in Chapter Three. It becomes impossible then to analyze the effects of a letter grade treatment in terms of an output measure which incorporates this very grade. On the other hand, we can examine the effects of freshman grades on grades received in subsequent years. For this reason, students attending school for one year only are sorted into separate categories of the output measure. Specifically, they are termed

TABLE 5.1

PERCENT OF STUDENTS WITH HIGH ABSENCES, COMPARING STUDENTS IN TOP AND BOTTOM QUARTILES IN LANGUAGE APTITUDE, CONTROLLING FOR LETTER GRADE RECEIVED IN ENGLISH AND SCHOOL YEAR AND COMBINING THE CLASSES OF 1969 AND 1970, BLACKS ONLY*

	Language Aptitude:					
	Bottom Quartile:			Top Quartile:		
English Grade:	A or B	C	D or E	A or B	C	D or E
Grade 9:	35% (23)	38% (78)	49% (77)	14% (78)	29% (58)	41% (39)
Grade 10:	33% (24)	46% (52)	58% (80)	18% (61)	27% (49)	48% (29)
Grade 11:	27% (15)	42% (66)	65% (99)	19% (91)	16% (51)	52% (31)
Grade 12:	20% (20)	43% (47)	52% (107)	17% (92)	27% (49)	61% (36)
TOTAL:	29% (82)	42% (243)	56% (363)	17% (322)	25% (207)	50% (135)

*Language aptitude is measured by the ninth grade Language SCAT test grades nine and ten and the eleventh grade Language SCAT test for grades eleven and twelve. See the preliminary note to Appendix B for an explanation of the SCAT tests. To be included in the high absence rate category, a student had to be in the bottom half of the annual attendance distribution for his school class.

"PreSeniors" if the one year attended was other than twelfth grade and "Seniors" if they attended twelfth grade only. This distinction relates to our uncertainty as to the status of students departing the sample, e.g. whether they are transfer-outs or dropouts. Unlike other one year attenders, "Seniors" may have successfully completed school careers with the sample cohorts. Both of the categories are non-evaluative in a general sense.[1]

With the exception of one year attenders, students receiving the letter grades "A" or "B" in a major subject in their final year of attendance will be assigned to the high-valued category of the output measure. It is reassuring to note that the official Transurbia definition of "B" level work is that it is "good." The output measure does not pretend to embody a profound understanding of school impact--it is possible that in the course of a lifetime, good grades in high school are inversely correlated with self-actualization and a life which benefits family and community. All this particular output measure aims to represent is the immediate adaptation of the student to the school situation--his success or failure in terms that reflect the organization's values. Therefore at the other extreme category of this measure, we wish to place academic renegades--those who seem to expend the least effort to acquire official rewards.

This being so, school dropouts are obvious candidates for placement

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[1] In the analysis, it will appear reasonable to interpret the premature departure of a large percentage of students allocated to certain process event conditions as indicative of a negative impact. Where this occurs, it will be discussed. As a general rule, the status of "PreSenior" is equivocal with respect to evaluative implications.

in this extreme category. High grades are the zenith of academic accomplishment, but graduation is still considered an important value. As a general rule, we wish to separate on our output measure those students who drop out from those who stick it out.[1] If we are not sufficiently impressed with the careers of the sticker-outers to label them "Academic Identifiers," we may call them "Academic Neutrals." They form the residual category of the typology, those who neither identify strongly enough with the school program to acquire high final grades nor who are sufficiently disaffected with school to leave. However, the fact of graduation is in itself no sure sign of high or even neutral academic identification. The low grading curve at Transurbia indicates that many students are socially promoted and it is not unreasonable to imagine that some manage to suffer through school and to graduate expending little effort and acquiring few rewards. Like the paradigmatic dropout, we may imagine such students to be academic renegades--in

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[1]Unfortunately no independent measure of school dropouts as distinct from transfer-outs was available to us so that actual assignment to this group was predicated upon the following rule of thumb. If a student left school prior to grade twelve and his final year's grades included an "A" or "B" in a major subject, he is assigned to the "Academic Identifier" class. This presumes that such students are likely to continue their education and to do well. If a student left school and did not have a high grade to his credit at the time of his departure, he is considered a dropout. No doubt this procedure misclassifies some perfectly well-adapted students whose families move to different school districts and who continue their education there. However, it seemed worthwhile to this investigator to give the benefit of a real doubt to those students who managed to "stick it out" till twelfth grade at Transurbia High and accord them a differential output rating as distinct from the early departees for whom no certain proof of continued education was available. Departing students who had attended for only one school year are exempted from this distinction, being classified as "PreSeniors" instead.

the main, their identification with the academic program at Transurbia High School is minimal. Such students are also included in the "Academic Renegade" category of the output typology. They are identified by the following characteristics: they receive either a "D" or an "E" in twelfth grade English and they fall into the highest quartile in twelfth grade absences. Considering the high absence rates at Transurbia High School, such students appear marginal at a common sense level, having missed at least thirty-six days for the Class of 1969 cohort and at least fifty-two days for the 1970 Class.

It is possible to depict the output typology now in terms of its component variables--to diagram what has been called the property space of the measure.[1] In doing this, we need to recall our earlier decision to separate out students who attended Transurbia High School for only one year. Such students themselves are divided into two classes--those who left school before twelfth grade (and who may then be dropouts) and those who entered and left as seniors. The former will be called "PreSeniors Only" and the latter "Seniors Only." Altogether the following elements figure in the assignment of a student to a category on the output typology: number of years attending Transurbia High; whether student attended twelfth grade; his grade in major subjects during his final year; his grade in English during his twelfth grade year; his twelfth grade absence rate. Most of these elements are represented in the following diagram.

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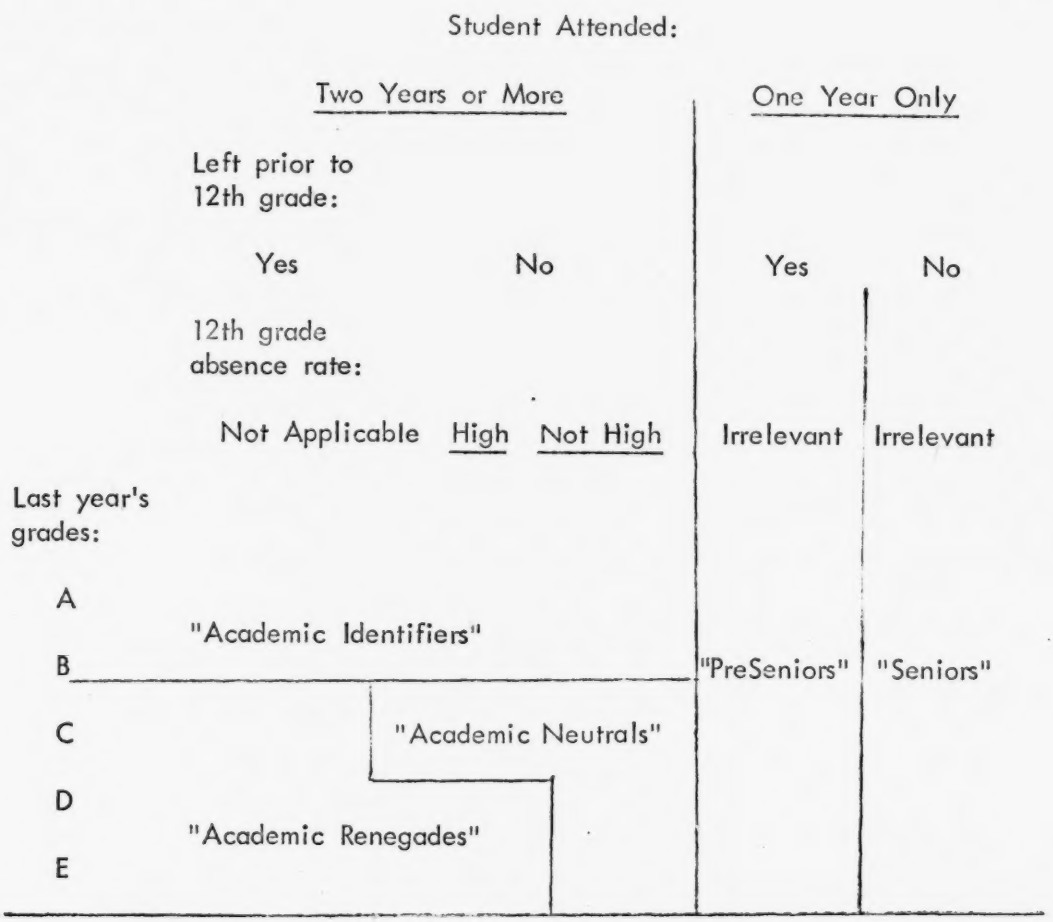
[1]See Allen H. Barton, "The Concept of Property-Space in Social Research," in Paul F. Lazersfeld and Morris Rosenberg (eds.), The Language of Social Research (New York: The Free Press, 1955), pp. 40-53.

PROPERTY SPACE OF THE OUTPUT TYPOLOGY



Output Measure in Profile

We have explored the logic and rationale of the output typology but have not considered how students are distributed on this variable and what sort of students fall into which categories. One way of validating a measure is to create a conviction that it measures what it pretends to by demonstrating that it correlates in a predictable fashion with other variables. In this section we will examine the relationship between the Academic Identification Typology and

several variables. In addition to supporting the thesis that this output measure is reasonable, this presentation will serve to introduce and describe major independent variable descriptors to be used in the next chapters.

It is a commonplace feature of the American educational system that girls tend to outperform boys at the elementary and secondary levels though they are less likely to attend college. Stereotypically, girls accept school values of neatness, punctuality, and discipline more readily than boys while receiving less family and societal support for higher education.[1] This being so, we would anticipate that girls will be disproportionately represented in the Academic Identifier category and underrepresented in the Academic Renegade category. Table 5.2 shows the percentage of girls and boys in each of the output categories for each school class separately and overall for the entire sample. The output patterns broken down by sex are similar for the two classes: overall girls constitute 64% of the Identifiers but only 49% of the Renegades. These data support the contention that the output measure reflects identification with the school program.

As was noted in the last chapter, the rapid influx of blacks to Transurbia in the late '60's was accompanied by a decline in the SES of the blacks and by a tendency for children from "fatherless" homes to enter the school system. In Transurbia these tendencies are highly related since the

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[1]For a discussion of lower female aspirations for higher education in relationship to intelligence and to socioeconomic origins, see William H. Sewell and Vimal P. Shah, "Socioeconomic Status, Intelligence, and the Attainment of Higher Education," in Ronald M. Pavalko (ed), Sociology of Education: A Book of Readings (Itasca, Ill.: F. E. Peacock Publishers, 1968), pp. 113-138.

TABLE 5.2

PROFILE OF OUTPUT MEASURE CATEGORIES
BY SEX OF STUDENTS, CONTROLLING FOR SCHOOL CLASS,
BLACKS ONLY

	Output Measure:					
	Academic Identifier	Academic Neutral	Academic Renegade	Pre-Senior Only	Senior Only	TOTAL
Class of 1969:						
Male:	39	47	50	51	52	46
Female:	61	53	50	49	48	54
	100%	100%	100%	100%	100%	100%
	(186)	(159)	(110)	(93)	(31)	(579)
Class of 1970:						
Male:	33	46	52	44	70	45
Female:	67	54	48	56	30	55
	100%	100%	100%	100%	100%	100%
	(175)	(173)	(148)	(116)	(44)	(656)
TOTAL:						
Male:	36	47	51	47	63	46
Female:	64	53	49	53	37	54
	100%	100%	100%	100%	100%	100%
	(361)	(332)	(258)	(209)	(75)	(1235)

children from broken homes tend to be disproportionately lower in socio-economic status relative to their black peers from intact families. Reliable information was available on family structure from the school records in Transurbia while direct SES data were scanty. The social status variable in Table 5.3 is operationalized then on the basis of this family structure information as follows: "high" status indicates that the mother and father were both present in the home; "low" status indicates that one or both parents were not present. The social status variable then is a measure of convenience rather than a pure indicator of either family structure or socioeconomic differences. It is an amalgam of what are generally held to be disadvantageous social characteristics so that we would expect to find a disproportionate number of low status students in the Academic Renegade category of the output measure. Table 5.3 shows the relationship between the Academic Identification Typology and this social status variable for both school classes. Looking at the combined class totals, 41% of the Renegades are of low status and an additional 24% are missing information on this dimension, whereas 33% of the Identifiers are low in social status while 8% lack information.[1]

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[1]The high variance on the no information category reflects an important oddity of working with school records: the more marginal students tend to be greatly underrepresented in virtually all areas of possible documentation. This is notably true of standardized tests with the effect that class results tend always to be inflated to the extent that marginal students are more likely to absent themselves from the testing or, perhaps, to be absented by the school administration. Students on whom information is lacking in the records probably are disproportionately of low status. The social status variable in Table 5.3 might better be interpreted as a dichotomy of "high status" versus "other," meaning low status or no information. Were we to do this, the magnitude of the differences in the social status profiles of the output categories would be more realistically large: 59% of the Identifiers being of high status, 53% of the Neutrals, but only 35% of the Renegades. Overall the relationship between the output typology and the social status variable is quite consistent with the interpretation of the typology as an indicator of identification with school.

TABLE 5.3

PROFILE OF OUTPUT MEASURE CATEGORIES
BY SOCIAL STATUS OF STUDENTS
CONTROLLING FOR SCHOOL CLASS, BLACKS ONLY

	Output Measure:					
	Academic Identifier	Academic Neutral	Academic Renegade	Pre-Senior Only	Senior Only	TOTAL
Class of 1969:						
High Status:	61	52	40	33	42	49
Low Status:	34	42	45	40	52	40
No Info.:	5	7	15	27	6	11
	100% (186)	101% (159)	100% (110)	100% (93)	100% (31)	100% (579)
Class of 1970:						
High Status:	57	55	31	22	16	42
Low Status:	32	38	39	27	41	35
No. Info.:	11	7	30	51	43	23
	100% (175)	100% (173)	100% (148)	100% (116)	100% (44)	100% (656)
TOTAL:						
High Status:	59	53	35	27	27	45
Low Status:	33	40	41	33	45	37
No Info.:	8	7	24	40	28	18
	100% (361)	100% (332)	100% (258)	100% (209)	100% (75)	100% (1235)

Schools are places in which academic talent tends to be rewarded. For this reason, we would expect students of greater ability to be disproportionately represented in the Academic Identifier category and underrepresented in the Renegade category. The measure of academic talent used to describe this relationship in Table 5.4 is called the Academic Potential Index. The large number of standardized tests administered to Transurbia students, their comparability as gross measures of academic aptitude, and the desire to situate as many students as possible on an academic aptitude measure prompted the use of an index rather than reliance on any single test. The index was developed to represent the maximum, indicated potential of each student. If a student ever scored in the highest quartile relative to other Transurbia classmates on one of the standardized tests, he was assigned to the "Hi Potential" category.[1] If he never scored above the 40th percentile locally and had at least one score in the bottom quartile, he was assigned to the "Low Potential" category. Otherwise he was assigned to the category labeled "Mid Range," or, if no test score at all was available, to the "No Information" category. Since the test score means of the Transurbia classes tend to be only slightly below national norms, the Academic Potential Index is a rough measure of potential on a national as well as local standard.

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[1]The tests used varied by school class. For the Class of 1969, the following were employed: eighth grade reading and math aptitude, eighth grade I.Q., ninth and eleventh grade language and math SCAT's, ninth and tenth grade general reading level scores, and the verbal and math CEEB's. For the class of 1970, all of the above were utilized except for the eighth grade reading and math aptitude scores which were not available. In addition, an eleventh grade general reading level score was employed.

TABLE 5.4

PROFILE OF OUTPUT MEASURE CATEGORIES
BY ABILITY POTENTIAL OF STUDENTS,
CONTROLLING FOR SCHOOL CLASS, BLACKS ONLY

	Output Measure:					
	Academic Identifier	Academic Neutral	Academic Renegade	Pre-Senior Only	Senior Only	TOTAL
Class of 1969:						
High Potential:	67	30	27	15	7	38
Mid-Range:	19	40	29	24	26	28
Low Potential:	10	23	32	34	13	22
No Info.:	4	6	12	27	55	13
	100%	99%	100%	100%	101%	101%
	(186)	(159)	(110)	(93)	(31)	(579)
Class of 1970:						
High Potential:	57	41	21	21	5	35
Mid-Range:	23	30	31	16	14	25
Low Potential:	14	23	33	16	7	20
No Info.:	6	6	15	47	75	20
	100%	100%	100%	100%	101%	100%
	(175)	(173)	(148)	(116)	(44)	(656)
TOTAL:						
High Potential:	62	36	24	18	5	36
Mid-Range:	21	35	30	20	19	26
Low Potential:	12	23	33	24	9	21
No Info.:	5	6	14	38	67	17
	100%	100%	101%	100%	100%	100%
	(361)	(332)	(258)	(209)	(75)	(1235)

The data in Table 5.4 show a strong overrepresentation of "Hi Potentials" in the Identifier category and a corresponding underrepresentation in the Renegade category for both school classes. Combining the two classes, we find 62% of the Identifiers are "Hi Potentials" versus only 30% of the Renegades. Similarly, "Low Potentials" are overrepresented in the Renegade category as are "No Informations." The figures here are 12% "Low Potential" and 5% "No Information" for Identifiers in contrast to 33% and 14% for the Renegades. Once again, the data strengthen the conviction that the output measure is related to academic identification.

In this regard, one further variable is worth considering since it is one of the most commonly used output measures of high school performance. Regrettably, reliable data on college attendance are available only for the Class of 1969. If the output typology measures identification with the academic program at Transurbia, we would expect it to correlate highly with college attendance. The data for the Class of '69 are presented in Table 5.5; it confirms our previous profiles by showing a strong positive relationship between attendance at college and academic identification. Looking just at Class of '69 students who graduated and on whom college attendance information was available, we find 57% of the Identifiers attending a four year college in contrast to 6% of the Renegades. Similarly only 28% of the Identifiers had no college plans as opposed to 80% of the Renegades.

Summarizing the profiles of the output measures, we have found a uniform pattern of relationships between the output categories and a variety

TABLE 5.5

PROFILE OF OUTPUT MEASURE CATEGORIES
BY COLLEGE ATTENDANCE OF
CLASS OF 1969 GRADUATES, BLACKS ONLY*

	Output Measure:					
	Academic Identifier	Academic Neutral	Academic Renegade	Pre-Senior Only	Senior Only	TOTAL
No College Plans:	29	54	80	-	58	47
2 Yr. College or Technical School:	14	22	14	-	21	17
4 Yr. College:	57	24	6	-	21	36
	100%	100%	100%		100%	100%
	(162)	(138)	(51)		(19)	(370)

*College attendance information is derived from students' permanent record cards via the School Records Codesheet (Appendix E); it is based on notations about final high school transcript being sent to college. It is possible that the college attendance figures in this table are slightly inflated.

of independent variables consistent with what one could have predicted for a measure of academic identification. These descriptions reinforce the interpretation of the school record-derived output typology as a measure of academic identification.

In this chapter we have described the output measure for the case study. In the next chapter we shall examine the effects of participation in Transurbia High School's freshman English program in terms of the students' subsequent academic identification.

CHAPTER VI

CASE STUDY:

AN ANALYSIS OF INHERENT INEQUALITY

What happens to students from different subgroups who are situated in the same process event condition? If we observe that one group shows a lower output measure profile, are we entitled to attribute this to the effects of participation in that process event condition? Finally, if we do find differences in treatment "effects," how may we explain these? These questions indicate the subjects to be discussed in this chapter.

Underlying the topics in this chapter is a concern that the nature of process events in schools may result in unsuitable treatment for members of different subgroups. This concern is summarized in the notion of "inherent inequality" which relates to the appropriateness of a profferred treatment for different client types. For example, suppose a school required that all students enroll in four years of a foreign language. This requirement might be unsuitable for those students whose career aspirations do not realistically require expertise in a foreign language. Or more dramatically, suppose a doctor were to perform appendectomies on all members of a hospital ward, irregardless of their diagnosis. Both these examples point up an important characteristic of organizational treatments--they may be differentially matched to the needs of different subgroups. To the extent that a subgroup is exposed

to process event conditions that are ill-suited to their needs, we shall say that an inherent inequality exists. Of course, if the treatment is ill-suited to the needs of all recipients, we will be more blunt and say that the treatment is either ineffective or pernicious.

The existence of some inherent inequalities is probably beneficial to the accomplishment of the socializing goals of people-processing organizations so that this terminology should not be taken to entail a blanket criticism. Schools are a very good case in point since it is traditional for them to reward the academically talented at the expense of the less talented. Although this tradition probably would benefit from scrupulous examination, it is reasonable to imagine that some sort of disproportionate reward structure may be needed to encourage the full development of academic talent in all students. Similarly, it is uncertain that any school athletic program could be successful if it did not reward the physically capable at the expense of the less capable.

Broadly speaking then, our concern with inherent inequality in this chapter will focus on inequalities which are unintended. It would be of limited value to show that the brighter students at Transurbia High School tend to fare better than their classmates. Such a finding would hardly be unexpected. Its greatest interest is that it attaches to a philosophical maelstrom as to whether public schools should promote excellence at the expense of equality.[1] And though worthwhile of itself, this controversy

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[1]Defined as the provision of educational gains for the greatest number of students, an egalitarian ethos has long been a characteristic of public

would not help demonstrate the methodological principles of process accounting. These reflections, however, do point up an important characteristic of inherent inequalities in general which is that they invariably have their source in the convergence of differential input characteristics of subgroup members (e.g. academic talent) and the nature of the process events (e.g. a reward structure keyed to talent). Thus explanations of findings of

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education in America. In The Irony of Early School Reform (Boston: Beacon Press, 1970) which relates to the increasing provision of public education to all children, Michael B. Katz is sharply critical of reformers who, he believes, promoted arrangements which estranged lower classes from the public school system. His cogent argument questions the reality of early egalitarianism related to the school system yet it seems to underscore the extent to which an egalitarian ethos had become attached to the public school institution. Similarly, Lawrence Cremin depicts the progressive movement in American education as partly an attempt to make workable and relevant universal public education, that is, to distribute education meaningfully to all segments of American society. See Lawrence A. Cremin, The Transformation of the School (New York: Vintage Books, 1961). Martin Trow and Alan B. Wilson likewise note the persistence of the American ethos of equality of educational opportunity. See Martin Trow, "The Second Transformation of American Secondary Education," in R. Bendix and S. M. Lipset (eds), Class, Status and Power, second edition, (New York: The Free Press, 1966), pp. 437-449. Alan B. Wilson, "Social Class and Equal Educational Opportunity," Harvard Educational Review, Equal Educational Opportunity (Cambridge, Mass.: Harvard University Press, 1969), pp. 80-87. More recently, especially in the post-Sputnik area, excellence as an alternative socializing goal has been greatly discussed and defended. According to this, public schools are expected to discover, to encourage, and to provide specialized training for students of exceptional academic talent. The rationale for this goal is that such students merit a disproportionate allocation of public resources because they are able to contribute more to the overall public good in a technologically advanced society. Advocates such as James B. Conant and John W. Gardner recognize the possible conflict between the goals of excellence and equality. They tend to apologize for their concern with excellence by subscribing to a belief that America's super-abundance of material resources will permit the simultaneous achievement of both socializing goals. See James B. Conant, The American High School Today (New York: McGraw-Hill Book Company, 1959), and The Comprehensive High School (New York: McGraw-Hill Book Company, 1967), and John W. Gardner, Excellence: Can We Be Equal and Excellent Too? (New York: Harper & Row, 1961).

inherent inequality require the specification of differential input characteristics as well as isolation of specific structural features of the process events in question. Inherent inequalities stem from the interactional effects of structural properties on these preexisting subgroup differences.

Although we shall not engage in an examination of the range of social values which school organizations promote, our focus on the interactional effects of school structures on students does involve certain value presuppositions. These, of course, include the value assumptions discussed in Chapter Five which relate to the dependent variable of academic identification, i.e. that it is a measure of "goodness." In addition we shall assume that differences in the output measure profiles of subgroups reflect characteristics of the subgroup rather than deliberate attempts to discriminate against subclasses of students. The only exception to this assumption of non-discrimination concerns the matter of special treatment of the academically gifted. Consequently so long as the level of talent is controlled, subgroup differences will be attributed to antecedent characteristics of subgroup members rather than intentional, policy decisions. The special province of process accounting resides in the discovery and explanation of instances wherein subgroup differences reflect both the antecedent characteristics of students and the structural properties of process events. We shall judge such interactional effects as pernicious to the extent that they appear to be the unnecessary outcomes of inappropriate structural properties for the particular student subclasses. Our central value assumption then is that any instance of maladaptive behavior is wrong which can be traced, even in part, to

manipulatable (and thus potentially remediable) features of organizations such as process events. This assumption was implicit in our discussion in Chapter One of the transforming characteristics of modern society so eloquently disclaimed by C. Wright Mills.

One further reflection on the general topic of inequality of treatment may help clarify the scope of process accounting methodology to be demonstrated in this chapter. When looked at in an overall sense, the existence of any substantial output measure difference between members of two subgroups in relationship to the experience of participating in an organization is certain testimony to the existence of either an intended or an unintended inherent inequality.[1] However when one considers fragments of the overall picture such as different ability settings, each one of which may be described as a separate process event condition, one may find no significant inherent inequalities. And this may occur in schools in which large overall subgroup differences are found which really are treatment effects! What underlies this situation is the obvious fact that different contexts may be differentially effective and that subgroup members need not be evenly distributed to all contexts. At a common sense level, if brighter students are assigned to the best teachers, they may benefit from a

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[1]This is a very tricky statement and much weight should be given to the phrase "in relationship to." Clearly a "finding" that brighter students (higher I.Q.) read better (higher reading scores) would not necessarily testify to an inherent inequality of treatment. For this to be the case, evidence is required that the reading scores of the brighter students are higher than expected in a way which suggests that they received disproportionate benefits from the school. Use of output measures that are not directly tied to preexisting levels of skill simplifies the discovery of inherent inequalities.

"distributive inequality" which may be entirely in addition to the fact that they also receive higher grades in all the different contexts. Inherent inequalities always relate to the experience of the same process event condition whereas distributive inequalities arise from differential access to more favorable process event conditions.

It goes beyond the scope of the present case study to analyze distributive inequalities because this requires a determination of the absolute efficacy of different process event conditions. Such an evaluation is virtually impossible short of a controlled experiment.[1] For this reason the circumscribed nature of our sphere of inquiry must be stressed. We shall be looking at the output measure profiles of two subgroups under a variety of process event conditions. Our comparisons will always be between two groups in the same setting on whom available background data suggest an equal likelihood of success in school, i.e. one group is not more talented than the other. This sort of analysis does not require knowledge of the overall effectiveness of the different process event conditions so that it will remain possible that one of these subgroups does less well in school specifically because it tends to be

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[1]Perhaps this claim should be qualified. Distributive inequalities clearly arise if process event conditions differ in their efficacy but inequalities might also arise if certain process event conditions are more socially valued in themselves. In such cases one does not need an experimental design to certify this phenomenon. For example, were the "prestige" of a high ability group sufficiently great, admission to it might, ipso facto, constitute a distributive inequality irregardless of the high ability group's long term efficacy in improving life chances. In this case study, no attempt is made to sort out the intrinsic social value of the various process event conditions so that this sort of distributive inequality is not examined. Therefore we will not consider the high school's own prestige system and the differential valuations which are placed on the various curriculum placements.

consigned to less favorable settings. The focus of process accounting then is on the relative effects of identical treatments on subgroups and not on the effects of differential allocation to treatment settings. Until schools are willing to adopt allocation techniques which involve the random assignment of students to experimental and control groups, it is doubtful that any satisfactory analysis of distributive inequality will be possible.[1]

In sum, the examination of inherent inequalities associated with the ninth grade English program at Transurbia High School involves an application of the process accounting methodology described in Chapter Three. We will examine differences in treatment "effects" for students differing in social status. These particular subgroups are being used because data on them were available in the school records. As discussed in the previous chapter, social status consists of a dichotomy between "high" status in which a father and mother are both present in the home and "low" status, which most often means that the mother is the only adult member of the immediate family.[2]

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[1]For example, it is virtually impossible to assess the efficacy of ability grouping although many attempts have been made. As long as this practice is universal within a school, there is no means to identify the expected output measure profiles of students not grouped by ability. And since very few secondary schools do not employ ability grouping, it is all but impossible to utilize a matched school model of analysis. For summaries of the literature on ability grouping research, see Miriam L. Goldberg, et al, The Effects of Ability Grouping (New York: Teachers College Press, 1966) and Alfred Yates (ed), Grouping in Education (New York: John Wiley & Sons, 1966).

[2]This social status variable relates only inadvertently to the family structure of blacks and so should not be mistaken with the controversy that centers on this topic. As discussed in Chapter Five, we do not have adequate socioeconomic data to distinguish effects of family structure from those of social class. Moreover we shall argue that for process accounting purposes, this kind of demographic variable is a poor substitute for personality measures. On the

Seven process events associated with freshman English will be reviewed in order to discover inherent inequalities of treatment associated with social status. Afterward we shall seek to explain several findings of inherent inequality in accordance with the unified theory of reference group behavior discussed in Chapter Two.

Discovery of Inherent Inequalities

Let us turn directly to the school records data. Table 6.1 shows the distribution of students differing in social status to the categories of the output measure in terms of their ability placement in freshman English. A consistent pattern emerges from this table: the subsequent academic adaptation of high status students is somewhat better in all contexts. This difference does not appear to stem from differences in the academic abilities of these two subgroups since their mean eighth grade I.Q.'s are similar in each process event context.[1] While Table 6.1

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issue of the black family, see Lee Rainwater and William L. Yancey (eds), The Moynihan Report and the Politics of Controversy (Cambridge, Mass.: The MIT Press, 1967) and Robert B. Hill, The Strengths of Black Families (New York: Emerson Hall Publishers, 1972).

[1]Subgroup means on the I.Q. test are being used here in a way which very much resembles a statistical "control" for academic aptitude. These mean scores do not, of course, constitute a control since this would require the insertion of a control variable which would make the reading of this percentage table extraordinarily difficult. Using mean scores as proxies for control variables leaves open the possibility of an ecological fallacy. Yet this risk is run throughout this chapter in light of the unpalatability of overcomplicating the tabular presentations. To the extent that the social status subgroups within the various process event conditions exhibit a high similarity in I.Q. means, it is reasonable to suppose that a true control for I.Q. is unnecessary. I.Q. scores were available on approximately 65% of the sample students. To guard against the possibility that these students differ in their output profiles in ways which would distort the subgroup comparisons of Table 6.1, this table was rerun with only those sample students having I.Q. scores included. Failure to do this might result in what Campbell and Stanley would term invalidity due to mortality (c.f. p. 43). This rerun procedure was followed for all tables in this section: in virtually all cases subgroup differences persist. These tables are presented in Appendix D.

TABLE 6.1

ACADEMIC IDENTIFICATION BY SOCIAL STATUS
AND ABILITY CONTEXT IN NINTH GRADE ENGLISH

Ability Context:	High								Low	
	1		2		3		4		5	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	(8)	(4)	76%	54%	44%	37%	23%	18%	25%	31%
Neutral:	-	(1)	13%	20%	39%	37%	40%	34%	46%	29%
Renegade:	-	(1)	6%	23%	9%	17%	22%	30%	23%	29%
PreSenior:	-	-	5%	3%	8%	8%	15%	18%	7%	12%
	(8)	(6)	(85)	(35)	(173)	(95)	(134)	(137)	(61)	(42)
Mean Junior High I.Q.:	125	124	114	112	104	105	96	94	89	87
N:	(8)	(6)	(79)	(26)	(142)	(71)	(114)	(91)	(46)	(31)

suggests that there may be differential benefits to high status students in the ability grouping system of Transurbia High School, it does not pinpoint any one ability setting as especially promotive of these.

Table 6.1 is a descriptive table; it provides little evidence for asserting that the experience of the different process event conditions caused the lower output profile. In order to be reasonably certain of this, we need evidence that the subgroups were initially similar on a variety of characteristics related to academic orientation. To be sure, academic aptitude (I.Q.) is such a characteristic but so too are many others on which no data are available. For example, differences in motivation, in economic support, in responsibilities at home--all these might tend to depress the aspirations of adolescents of low social status and lead them to a lower academic orientation. If anything, the uniformity of the social status differences across the various ability contexts argues for such an interpretation. To counter this interpretation, we need to discover non-uniform contextual differences. This need is an artifact of the inadequacy of the case study monitoring data--that measurement of initial attitudes and circumstances are not available. Though not a theoretical requirement, it is a factor of great relevance for this study. It provides a practical standard for interpreting the impact of subgroup differences as likely effects of context per se.[1]

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[1]The argument for this standard may be explicated by several propositions. Suppose that unknown personality traits P_n predispose individuals to be unable to acquire high academic identifications. Suppose that P_n are more likely to be found in low status students. It follows from these two statements that all comparisons between students differing in social status on a measure of academic identification will tend to favor high status

Differences related to grading context are presented in Table 6.2. With respect to inherent inequality, the portrait of the two groups in Table 6.2 seems almost a duplicate of Table 6.1. Social status differences within the high- and middle-graded contexts are found, while the difference in the low-graded context is quite small. Though the smallness of the differences in the low-graded section is puzzling, overall Table 6.2 lends itself to attributing social status differences to unknown individual differences rather than context alone.

Table 6.3 shows the relationship between the two social status subgroups and the output measure when letter grade received in English is controlled; it represents a different sort of "process event" than those considered previously in this chapter. Throughout our discussion to this point, process events have been held synonymous with organizational treatments rather than individual properties. Yet letter grades seem to be a mixture of individual and organizational properties. On the one hand, letter grades derive from letter grading systems which are unambiguously organizational rather than individual phenomena. In this vein, the existence of an "A student" depends on the existence of the labeling system and not simply on

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students, ceteris paribus. Since we are committed to examining such comparisons under different group contexts and letter grade conditions, we must ask whether there is anything about these process structures per se which nullifies the ceteris paribus. On a logical basis, it is difficult to imagine the source for such a nullification. For example, suppose that "D" and "E" students in low ability groups tend to come from very poor families. Why then suppose that this tendency obtains only for low status students and the "D" and "E" students of high status are not also relatively less wealthy? As long as comparisons are made within the same context or the same treatment setting, it is plausible to think that ceteris paribus applies.

TABLE 6.2

ACADEMIC IDENTIFICATION BY SOCIAL STATUS
AND GRADING CONTEXT IN NINTH GRADE ENGLISH

	Grading Context:					
	High				Low	
	1		2		3	
Social Status:	High	Low	High	Low	High	Low
Identifier:	61%	31%	45%	30%	26%	30%
Neutral:	21%	27%	35%	36%	44%	33%
Renegade:	12%	29%	12%	24%	17%	23%
PreSenior:	6%	12%	7%	10%	13%	14%
	(113)	(76)	(185)	(109)	(163)	(130)
Mean Junior High I.Q.:	109	101	102	102	99	96
N:	(101)	(48)	(149)	(76)	(139)	(101)

the existence of a set of stereotypic traits. Considered in this way, the data in Table 6.3 may be interpreted as showing the differential subgroup "reactions" to the experience of different conditions of the letter grading process event.[1] Accordingly, Table 6.3 shows that the social status subgroups differ rather little in their reaction to letter grades. Only with respect to the letter grade "C" do we find a difference of notable magnitude--that 10% fewer of the low status students become Identifiers while 16% more become Renegades.

Yet these same data are as easily discussed if letter grades are interpreted as individual properties. Arguing for this interpretation is the obvious fact that letter grades are tied to the behavior of individuals to the point that they would be meaningless, as such, if awarded randomly. Indeed if the letter grade has an impact on a student, it is probably because he feels acute satisfaction or dissatisfaction with what it tells him about himself. Possessing a winning or losing lottery number seems unlikely to engender comparable feelings related to self-esteem. As regards the data in Table 6.3

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[1]There is ample precedent in the literature for this sort of interpretation. By insisting that Table 6.3 be thought of as showing the reaction of students to letter grades, we tie this analysis to research linked to Merton's famous essay on the self-fulfilling prophecy. The gist of Merton's thesis is that individuals tend to be influenced by labels that are attached to themselves and to others quite apart from the actuality of behavior related to the meaning of these labels. These labels then become self-fulfilling prophecies to the extent that they lead individuals to acquire the suggested characteristics. This process is facilitated by the acceptance by others that the individuals do, in fact, possess the suggested characteristics. See "The Self-Fulfilling Prophecy," in Social Theory and Social Structure, op. cit., pp. 421-436. Work by Robert Rosenthal and Lenore Jacobson has shown this notion to have validity with regard to classroom behavior. See Pygmalion in the Classroom: Teacher Expectation and Pupils' Intellectual Development (New York: Holt, Rinehart, and Winston, 1968).

TABLE 6.3

ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND LETTER GRADE IN NINTH GRADE ENGLISH

Letter Grade:	A		B		C		D		E	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	67%	(3)	66%	57%	48%	38%	20%	16%	9%	16%
Neutral:	28%	(1)	20%	32%	36%	30%	48%	44%	31%	14%
Renegade:	-	-	7%	5%	10%	26%	23%	31%	29%	28%
PreSenior	6%	-	6%	7%	6%	6%	9%	9%	31%	42%
	(18)	(4)	(95)	(44)	(197)	(116)	(106)	(108)	(45)	(43)
Mean Junior High I.Q.:	112	*	107	105	102	100	100	98	97	96
	(17)	(1)	(84)	(34)	(168)	(79)	(89)	(83)	(31)	(28)

*Mean I.Q. Scores are not reported on fewer than five subjects.

under this interpretation we would say that when controlled for those traits which relate to academic performance, members of the social status subgroups exhibit only small differences in their output measure profiles. The only exception here concerns "C" students." Among this type of student, social status appears to be a bit more salient a determinent of academic identification. As a consequence, we find that 10% fewer of the low status students become Identifiers whereas 16% more become Renegades.

Here then is a very difficult problem of interpretation. If we choose either alternative we must arbitrarily deny the compelling claims of the other. A solution, which is no more than a thinly disguised evasion, suggests itself. Because the data in Table 6.3 are of interest under either interpretation, we shall simply present such data and beg the question as to whether they refer to process event conditions or to input characteristics of subgroup members. Thus our advertisement earlier in this chapter that we would examine seven distinct process events related to the ninth grade English program is true only insofar as letter grades are held to be process event conditions. We shall shortly consider tables in which letter grades and ability and/or grading contexts are controlled. Whether these are conjoint process events or specifications of the effects of classroom contexts on subclasses of the social status groups is moot. From the point of view of interpreting findings related to these tables, it is irrelevant since our interpretations will suggest that more meaningful antecedent characteristics of students must be discovered if process accounting is to supply satisfying explanations and useful policy advice. This implication is sustained under

either interpretation of letter grades.

In Table 6.4 the relationship between academic identification and social status is presented under the four contextual conditions which result from dichotomizing the ability and grading context descriptors. The pattern of the output measure profiles in this table is very interesting. In the sections which are high-graded, high status students evidence a notably more positive output measure profile. For example, 64% of these students become Identifiers in the high ability, high-graded classes in contrast to 39% of their peers. In order to indicate the strength of these more positive profiles, the chi-square statistic has been employed.[1] It indicates that differences in the high ability, high-graded context would occur by chance less often than one in a thousand times and that the differences in the low ability, high-graded sections would occur less often than one in twenty times. In contrast, whatever slight differences obtain in the low-graded sections appear to favor low status students. It seems then that we have discovered a non-uniform contextual effect. Put simply, low status students do not fare as well as others in those English class sections which are

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[1]For purposes of calculating chi-square, students classified as "PreSeniors" have been dropped from the table. As a result, chi-square is calculated with two degrees of freedom. In subsequent analyses, where and only where process event conditions pertain to low letter grades, the "PreSenior" category will be merged with the "Renegade" category in order to calculate chi-square. This statistic will also be based on two degrees of freedom. For a discussion of the reasons for this treatment of the "PreSenior" category, c.f. footnote p. 94. For an exceedingly clear description of the chi-square statistic, see M. J. Moroney, Facts from Figures (Baltimore: Penguin Books, 1965), also William C. Guenther, Concepts of Statistical Inference (New York: McGraw-Hill Book Co., 1965).

TABLE 6.4

ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT IN NINTH GRADE ENGLISH

Ability Context:	High				Low			
Grading Context:	High		Low		High		Low	
Social Status:	High	Low	High	Low	High	Low	High	Low
Identifier:	64%	39%	35%	50%	28%	23%	18%	20%
Neutral:	23%	34%	46%	30%	42%	31%	42%	35%
Renegade:	9%	18%	5%	18%	18%	33%	27%	26%
PreSenior:	4%	9%	14%	2%	11%	13%	13%	20%
	(192)	(92)	(74)	(44)	(106)	(93)	(89)	(86)
Mean Junior High I.Q.:	110	109	106	106	94	92	94	91
N:	(166)	(67)	(63)	(36)	(84)	(57)	(76)	(65)

$\chi^2 = 14.4$ $\quad$ $\chi^2 = 7.1$

df = 2 $\quad$ df = 2

$P < .001$ $\quad$ $P < .05$

high-graded. The similarity of Junior High School I.Q. scores among the subgroups within contexts suggests that differences in academic aptitude cannot account for this finding.[1]

Without pressing for an immediate explanation, it may be useful to pursue this finding of apparent inherent inequality. The salience of grading context may derive from the tendency of low status students to get a disproportionate share of the lower grades in the high-graded sections but not in the low-graded ones, or these students may obtain lower profiles even when English letter grades are identical. Also both situations may exist simultaneously.

In Table 6.5 we find that low status students do indeed get disproportionately lower grades in the high-graded sections. The differences are statistically significant regardless of ability level in the high-graded sections.[2] This pattern also occurs in the low-graded, low ability English classes, though it is of lesser magnitude, while it does not occur at all in the low-graded, high ability English classes. There the distribution of letter grades is essentially uniform. Considering all four intra-context comparisons,

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[1]See Table D.4 in Appendix D which shows that the output profile differences persist when Table 6.4 is rerun with a sample limited to students whose I.Q. scores are available.

[2]For purposes of calculating chi-square in Table 6.5, the letter grade variable was trichotomized into "AB," "C," and "DE" categories resulting in the assignment of two degrees of freedom. The object of this was to keep the expected cell frequency levels in the calculations above 5 and also to utilize a consistent standard in the assignment of degrees of freedom.

TABLE 6.5

LETTER GRADE IN NINTH GRADE ENGLISH BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT

Ability Context:	High				Low			
Grading Context:	High		Low		High		Low	
Social Status:	High	Low	High	Low	High	Low	High	Low
A:	10%	6%	7%	4%	15%	8%	4%	-
B:	18%	12%	8%	12%	22%	16%	7%	2%
C:	47%	41%	32%	27%	47%	41%	36%	33%
D:	18%	20%	30%	32%	10%	20%	30%	35%
E:	7%	20%	23%	25%	6%	16%	23%	30%
	(192)	(92)	(74)	(44)	(106)	(93)	(89)	(86)
Mean Junior High I.Q.:	110	109	106	106	94	92	94	91
N:	(166)	(67)	(63)	(36)	(84)	(57)	(76)	(65)
	$\chi^2 = 7.49$				$\chi^2 = 10.45$		$\chi^2 = 6.36$	
	df = 2				df = 2		df = 2	
	$P < .025$				$P < .01$		$P < .05$	

Table 6.5 may be interpreted as evidence of a grouping effect.[1] The same logical canons apply to it as to Table 6.4: the non-uniformity of the subgroup comparisons across grading contexts in light of background characteristic comparability (I.Q.) make this plausible.[2] We will explore this finding in the next section after establishing a related point--that the academic identification of low status students in high-graded contexts is lower even when letter grades are similar.

Let us briefly summarize our discussion to this point. What we have been observing is that low status students who receive certain categories of organizational experience eventually manifest lower output measure profiles than their peers who are exposed to the same experiences. Are we to attribute this kind of finding to the mismatch of these treatment modalities to the needs of low status students (inherent inequality)? Or are we to believe that these students are destined to fare less well for reasons not associated with the nature of the process event conditions? For methodological reasons connected to the inadequacy of the Transurbia data file, we have stipulated that we will acquiesce in the latter interpretation where we find uniform subgroup differences across the various conditions of a process event. However, where these comparisons are not uniform, the supposition

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[1]To do this, we must assume that teachers in the high-graded English sections do not consciously discriminate against students from broken homes in assigning letter grades. That is, we must stipulate that English teachers apply the same grading standards to all students within each of their classes. This allows the further assumption that the behavior of students from broken homes in high-graded classes tends to be different from their classmates though not in low-graded ones.

[2]c.f. footnote, p. 116.

of pre-existing subgroup differences is less tenable so that we have decided to interpret these situations as evidence of inherent inequality of treatment. In Table 6.4, we found that low status students in high-graded contexts, where ability context was controlled, present much lower output measure profiles than their peers and that this pattern was not at all reproduced in the low-graded sections. Pursuing this finding of inherent inequality, we have developed a sort of scenario, to be depicted now as a diagram, which suggests that low status students do less well in high-graded sections because they tend to get a disproportionate share of the lower grades. The diagram below sketches this interpretation, which is supported in Table 6.5, by showing that the students actually do receive these lower grades.[1]

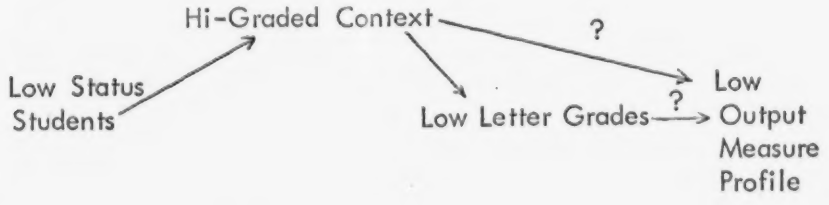

Diagram 6.1
Diagram Showing that Low Status Students get Low Letter Grades in High-Graded Contexts and that This may be Partly or Entirely Related to Their Relatively Low Output Measure Profiles in These Contexts.

The question marks in this diagram indicate further matters for investigation in this section--namely, whether academic identification also occurs in the absence of lower letter grades and, of course, whether the low grades

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[1]We also note in our discussion of Table 6.5 that these students also tend to get lower letter grades in the low-graded, low ability sections. This is not indicated in the diagram.

themselves in these particular circumstances are associated with poor academic adaptations for the students from broken homes. Finally we have noted that the finding of lower letter grades in Table 6.5 must itself be explained.

Because we have been undertaking a systematic review of process event inequities of treatment in this section, we will examine next the joint "effects" of ability context and letter grades, and postpone somewhat our pursuit of effects related to grading contexts. Our observations concerning Table 6.3 on the ambiguous status of letter grades should be recalled. That is, while we will nominally speak of the data in Table 6.6 as bearing upon six independent, conjoint process events, we will also accept the alternative interpretation that these data describe the "effects" of ability context when letter grade status is controlled. Under either circumstance, we find a rather complicated pattern of relationships in Table 6.6. Under most of the "six" conditions of the process event, differences between students differing on social status are small. These favor high status students in the upper ability context while the pattern is mixed in the lower ability context.[1] Altogether we might conclude that inherent inequality or selection differences--whichever it is that results in these differential output measure profiles--is less pronounced in ability contexts when letter grade is taken into account.

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[1]As examination of the base numbers in Table 6.6 will bear out, low status students receive lower letter grades in both ability settings. Were we to treat letter grade then as a dependent variable as in Table 6.5, no strong context effect would be found.

TABLE 6.6

ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH

Ability Context:	High						Low					
Letter Grade:	AB		C		DE		AB		C		DE	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	85%	75%	63%	50%	25%	24%	41%	42%	28%	29%	5%	10%
Neutral:	8%	21%	29%	34%	46%	35%	39%	42%	46%	27%	39%	35%
Renegade:	2%	4%	5%	12%	16%	29%	12%	4%	17%	36%	36%	31%
PreSenior:	5%	-	3%	4%	13%	11%	8%	13%	9%	8%	20%	24%
	(64)	(24)	(115)	(50)	(87)	(62)	(49)	(24)	(82)	(66)	(64)	(89)
Mean Junior High I.Q.:	114	111	107	109	104	107	99	96	92	93	91	90
N:	(58)	(19)	(100)	(36)	(71)	(48)	(43)	(16)	(68)	(43)	(49)	(63)

The issues raised with respect to the effects of high-graded contexts are further developed in Table 6.7. It is very clear from this table that the disproportionately lower grades of low status students in high-graded contexts are associated with subsequent weak academic identifications. While 54% of these students who obtain high grades in high-graded contexts become Identifiers, only 13% receiving low grades do likewise. Similarly only 5% of the "AB" students of low social status in the high-graded sections become Renegades versus 37% of these students receiving low grades. Beyond this, and relating directly to the diagram discussed above, we find that low status students manifest significantly lower output measure profiles when compared with their peers within the high-graded context who receive the same letter grades. All three comparisons, where letter grade is controlled, in the high-graded English classes in Table 6.7 are statistically significant in the manner indicated, whereas two of three comparisons in the low-graded context show low status students acquiring more favorable academic identifications than their peers receiving the same ninth grade English letter grades. Where this does not occur, (in the "C" condition), the difference is not statistically significant. The data in Table 6.7 help interpret the strong findings of contextual effects in Table 6.4 by showing these to be partly a matter of differential letter grades and partly a matter of differential academic identification related to the same letter grade experience. Were we then to redraw the diagram above, we would be entitled to remove both question marks.

TABLE 6.7

ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND GRADING CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH

Grading Context:	High						Low					
Letter Grade:	AB		C		DE		AB		C		DE	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	70%	54%	50%	35%	28%	13%	52%	(7)	43%	43%	8%	19%
Neutral:	18%	33%	35%	32%	34%	33%	33%	(2)	38%	28%	50%	37%
Renegade:	7%	5%	9%	26%	26%	37%	5%	-	13%	25%	23%	25%
PreSenior:	5%	8%	5%	7%	12%	17%	10%	-	7%	5%	19%	20%
	(92)	(39)	(141)	(76)	(65)	(70)	(21)	(9)	(40)	(40)	(86)	(81)
	χ^2 = 2.80		χ^2 = 12.20		χ^2 = 5.49				χ^2 = 2.70			
	*df = 1		df = 2		df = 2				df = 2			
	P< .10		P< .005		P< .10				P # .10			
Mean Junior High I.Q.:	109	104	102	102	102	100	105	103	99	98	97	95
N:	(83)	(26)	(116)	(47)	(51)	(51)	(18)	(9)	(52)	(32)	(69)	(60)

*Note that it was necessary to dichotomize the output measure categories here in order to calculate chi-square because of the smallness of the expected frequencies for the "Renegade" category.

Table 6.8 further specifies the impact of the grading context variable on low status students. This table shows that the interaction between grading contexts and the output profiles of the two groups is limited chiefly to the high ability, high-graded sections of ninth grade English. In Table 6.8 there are three letter grade conditions for each of the four classroom contexts portrayed in Table 6.4. According to the process accounting schema, twelve educational treatment modalities are portrayed in this table.[1] Confining our attention to the intra-process event condition subgroup comparisons, we find a consistent pattern of disproportionately favorable output measure profiles for high status students within each of the letter grade conditions of the high-graded, high ability context. For example, 91% of these students receiving high grades in this setting wind up their Transurbia High careers as Identifiers in contrast to only 71% of the low status students. Two of the three comparisons in this contextual setting are statistically significant at the levels indicated. In contrast, looking at the three letter grade conditions within the high-graded but low ability contextual setting, two of three comparisons show low status students from broken homes with more favorable academic identifications. It is, however, worth noting that the third comparison here runs counter to this trend and is highly significant statistically. Taking into account the broad picture presented in Table 6.8 we may conclude that most but not all of the differential impact on social status subgroups associated with high-graded contexts occurs in the high ability setting. Table 6.8

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[1]Alternatively, four treatment modalities are portrayed as in Table 6.4 and letter grades are controlled.

TABLE 6.8

ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH (cont.)

Ability Context:	High						Low					
Grading Context:	High						High					
Letter Grade:	AB		C		DE		AB		C		DE	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	91%	71%	63%	47%	38%	16%	64%	(6)	63%	58%	10%	36%
Neutral:	6%	24%	27%	37%	33%	35%	18%	(1)	33%	25%	62%	36%
Renegade:	2%	6%	7%	11%	21%	32%	-	-	-	17%	10%	24%
PreSenior:	2%	-	3%	5%	8%	16%	18%	-	4%	-	18%	4%
	(53)	(17)	(91)	(38)	(48)	(37)	(11)	(7)	(24)	(12)	(39)	(25)
Mean Junior High I.Q.:	115	114	108	109	106	108	110	107	108	109	103	104
N.:	(49)	(12)	(78)	(26)	(39)	(29)	(9)	(7)	(22)	(10)	(32)	(19)
	$\chi^2 = 5.41$		$\chi^2 = 2.36$		$\chi^2 = 5.44$						$\chi^2 = 6.85$	
	df = 1		df = 1		df = 1						df = 2	
	$P < .025$		$P \not< .10$		$P < .10$						$P < .05$	

TABLE 6.8 (cont.)

Ability Context:	Low											
Grading Context:	High						Low					
Letter Grade:	AB		C		DE		AB		C		DE	
Social Status:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	41%	41%	28%	24%	-	9%	40%	(1)	28%	36%	6%	11%
Neutral:	36%	41%	50%	26%	35%	30%	50%	(1)	41%	29%	40%	38%
Renegade:	13%	5%	14%	42%	41%	42%	10%	-	22%	29%	34%	25%
PreSenior:	10%	14%	8%	8%	24%	18%	-	-	9%	7%	19%	27%
	(39)	(22)	(50)	(38)	(17)	(33)	(10)	(2)	(32)	(28)	(47)	(56)
Mean Junior High I.Q.:	99	97	92	94	89	88	100	*	94	92	92	91
N:	(34)	(14)	(38)	(21)	(12)	(22)	(9)	(2)	(30)	(22)	(37)	(41)

$\chi^2 = 9.77$

df = 2

$P < .01$

*I.Q. scores are not reported on fewer than five subjects.

points out an additional characteristic of the high ability setting that is worthy of attention. It shows that low status students receiving low grades in the low-graded section of the high ability ninth grade English program end up with relatively more successful high school careers than their peers. In other words, in this particular process event condition, the usual pattern of findings is completely reversed. Thirty-six percent of the low status students become Identifiers in contrast to only 10% of their high status peers.

Reference Group Inequality

In a society which places a premium on education, any radical reordering of the academic identifications of adolescents, which itself is an accidental effect of institutional structure, must surely be reckoned an unwanted transformation of the human condition. These effects cannot be rationalized as serving alternative societal goals. If the pattern of inherent inequality in Transurbia is repeated elsewhere, many students may be unintentionally discouraged from continued education.

In attempting to construct explanatory models for the grouping effects found in the previous section, we will make use of as many simplifying assumptions as seem reasonable. A first is that the two findings summarized by Diagram 6.1 result from the same underlying dynamic. That is, whatever it is about high-graded contexts which leads low status students in them to obtain lower grades also leads these students to relatively lower academic identifications when their grades are on a par with their classmates in freshman English. As a start, if we are to theorize with credability, we

must discover some characteristic of high-graded contexts which is potent on an intuitive level.

Since high-graded sections are defined by the fact that their teachers award more high grades, we must consider the bases for these assignments. We have previously discounted discrimination, leaving then two more reasonable explanations.[1] The first is that high grades are given in return for high quality academic work. This, of course, would explain the relationship between high I.Q. and high grades explicit in Table 6.3. Yet the I.Q. spread in Table 6.3 is not nearly so great as to make unlikely the fact that high grades are frequently given to students of average and even below-average aptitude. For these students and perhaps for some of the others as well, high grades may signify a reward for effort rather than accomplishment. We may theorize then that classes which receive high grades tend also to be classes in which the general level of effort is higher and conversely lower grades imply a lower level of effort. It requires little imagination to leap from this proposition to the contention that high-graded classes are more competitive. Recalling that low-graded classes are ones in which 50% or more of the students receive "D" or "E" and interpreting these grades as partly indicative of low effort leaves little room to doubt that these environments are relatively non-competitive with respect to the acquisition of academic values.

In Table 6.5 the ability level of the grading context is controlled

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[1] c.f. footnote 1, p. 126.

so that subgroup differences in letter grades probably stem more from the level of effort than from that of academic excellence. Put differently, the more competitive the environment, the less likely are low status students to compete. Similarly, we may interpret the findings of Tables 6.7 and 6.8 along this same line, that low status students who are exposed to competitive environments early in their careers are less likely to develop strong academic identifications even if their initial levels of effort (as indicated by letter grades) are comparable.[1] This reformulation seems less intuitively satisfying than our interpretation of the lower letter grades in Table 6.5. We shall deal with it first in an attempt to develop an explanation which can be applied to both findings.

In Chapter Two we observed that group context effects of any kind may be explained by some variation of a unified reference group theory. The difficulty was that in its present state, this theory implied four possible

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[1]There are many interesting connections between this interpretation of group structure and Peter M. Blau's discussion of the effects of competition in the Dynamics of Bureaucracy, revised edition, (Chicago: The University of Chicago Press, 1963). Both case studies concern the impact on group members of statistical evaluation procedures. Blau's is a highly intensive analysis of the on-going interpersonal relationships within several rather small work groups, whereas this case study probes the statistical interaction between types of organizational experiences and subsequent adaptive behavior. Yet both studies observe the tendency of performance records to promote competition and both studies also conclude that competition does not lead uniformly to higher productivity. Another parallel of interest is that Blau, despite the small number of individuals within the work groups, focused on the differential impact on productivity on types of group members in relationship to the nature of their group. In this he almost seems to foreshadow the typological analysis described in this study. The many convergences between Blau's and the present study are not coincidental since an early reading of his work provided this researcher with his faith in the ultimate fruitfulness of analyzing school records in relationship to student academic performance.

outcomes each of which might lead to different practical results.[1] We concluded that the key to determining whether a group experience would lead to either a comparative group effect, a normative effect, neither, or both lay in assessing the individual's level of motivation to affiliate himself with the group.

We are now in a position to amplify this conclusion by stipulating the kinds of data that would be needed to determine the nature of the reference group effect. Although these data are not available to us in the case study, their specification provides the basis for further research. This specification also expands the unified model of reference group theory by making explicit several underlying assumptions.

In order to bring out these points, two "explanatory fables" will be presented--one which sees a comparative reference effect and another which points toward a normative effect. These are called fables because they lack validating data: following each, we will consider the kinds of data required to convert each to an explanation. We will then reapply these fables to explain the tendency of low status students to get lower grades in competitive class groups.

Fable 1

> The data in Tables 6.5, 6.7, and 6.8 illustrate comparative reference group effects of English class context. Stated simply, the hypothesis is that low status students see that many others around them have done much better and so get discouraged with school.

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[1] c.f. pp. 22-28.

Suppose that some adolescents require self-image gains or are unable to sustain self-image losses as a factor of group affiliation.[1] For them, the experience of a low grade in a high graded context may be devastating. They cannot escape awareness that their classmates have "outperformed" them. In this position only two ego-saving strategems are available: they may deny that they tried to succeed or they may interpret their failure as success. It thus becomes plausible to imagine very depressed profiles on the measure of academic identification for these students. Having ceased to value academic attainments and effort, these students drop out or remain quite marginal.

It is plausible to imagine that disadvantaged students have the same needs as their peers but fewer familial means to meet these. Such students are likely candidates to seek self-image support in the group experiences offered in schools. We have seen that the grouping effect occurs most strongly in the high ability groups. All students probably use their classmates to formulate self-assessments but the amount of ego-investment attached to these is likely to increase with ability. A student of mediocre talent will have discovered, prior to ninth grade, other aspects of his persona on which to peg his self-esteem. For high ability students with fragile self-images, exposure to low marks in ninth grade, uncushioned by an environment in which low marks are common, seems likely to provoke a traumatic reordering of their identification with academic values.

Data Required: We need to know the favorableness of students' self-images at the beginning of Grade 9. We also need to ascertain to what extent these images rely on academic success. If we find that high ability, low status students tend to have distinctly more "fragile" images of themselves, and if we discover that such students obtaining low grades in high-graded contexts, come to disown academic values, we will have supported the explanatory thesis in Fable 1.

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[1]Merton has remarked in lecture that the hierarchial schema of needs of the psychologist A. H. Maslow might usefully be applied to Parson's actor-situation framework. Maslow contends that man's ability to gratify other drives depends on his handling of the more basic security drive. Perhaps self-image is an aspect of this security need. If so, this fable is consistent with Maslow's schema. See Abraham H. Maslow, Toward a Psychology of Being (Princeton: D. Van Nostrand Company, Inc., 1962), pp. 42-56.

Table 2

Differences in academic identification between the social status subgroups are the result of normative reference group behavior. The normative reference model implies that an individual will acquire the dominant values of the group to which he belongs. In the high ability, high-graded context, these values include strong academic identification. The profiles of high status students in the high-graded sections of Table 6.8 suggest this kind of normative effect, though not that of the low status students. Data from the low-graded, high ability sections in Table 6.8 are inconclusive.

Low status students may tend to acquire deviant roles in groups in which they are greatly in the minority. This tendency might be reinforced by the competitive nature of the high-graded groups. Only 32% of the 284 students in the high ability, high-graded sections of freshman English in Table 6.8 are of low status. These students may feel themselves to be at a disadvantage socially. Friendship patterns may develop along social status lines. If the low status students feel outcast from the majority in these English class sections, they may develop norms of their own which downgrade the academic achievement motif of the other students. Thus Tables 6.5, 6.7, and 6.8 may testify to a double normative effect: one which raises the academic orientations of the low-achieving students of high status and another which impedes this orientation in low-achieving, low status students.

Data Required: We need to know patterns of association, admiration, and friendship among the students both at the beginning and the end of the freshman year. This will provide evidence of the emergence of distinctive cliques based on social status. We also need to ascertain the academic values of the students of these two points in time. If we can demonstrate shifts in values associated with clique formations, the hypothesis of a normative effect will be validated.

These fables may also be used to explain why low status students are less likely to compete in highly competitive environments. In accordance with Fable 1, such students are less able to risk self-image losses. For some of these students, short-term security gains are possible by adopting the strategy

of not trying. In less competitive environments, these same students might feel more free to compete, sensing that failure would be less devastating. This explanation might be termed an anticipatory, comparative reference group effect.

Similarly with respect to Fable 2, low status students may coalesce more easily into a "deviant" subculture in a competitive environment.[1] As this occurs in the course of the ninth grade year, we would expect these students to "underperform," responding to the lower productivity standards of the informal peer group.

Though quite different, these fables point toward a common deficiency in the unified model of reference group theory discussed in Chapter Two. Reference group theory intersects the fields of sociology and psychology. It is explicitly sociological insofar as group structure is an essential element of the explanatory dynamic. The distribution of letter grades in classroom contexts is a social, non-individual characteristic of the situation. But it is also psychological in that it depends on the dispositions of group participants to utilize group experiences in certain ways.

Consider the first fable. At the center of this explanation was the thesis that some students are initially more liable to be affected by self-comparisons involved in group experiences of certain kinds. Likewise,

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[1] Implicit in this explanation is the assumption that the competitiveness of high-graded sections increases the likelihood of "out-group" formations, a familiar response to external threat in the theory of Georg Simmel. The existence of the grading system supplies the basis for the external threat. See Lewis A. Coser, The Functions of Social Conflict (New York: The Free Press, 1956).

Fable 2 presupposed that certain individuals would feel themselves to be outsiders in certain situations--clearly this supposition also entails a notion of psychological predisposition.[1] The import of both fables then is to argue for a greater amount of individual-level information as a requirement for unraveling the reference group effects of social context.

This discussion has pointed out that different subgroups--not just those pertaining to social status but finer distinctions based on direct psychological measurement--are likely to be differentially affected by group experiences. Much more precise measurement of group effects will be possible if such subgroups are treated separately analytically. Perhaps when this kind of typological distillation becomes a usual characteristic of reference group analysis, greater appreciation of structural influences will be possible. As it is, we must suspect that psychological factors frequently mask structural effects.

This means that stronger associations should emerge between social contexts and output measures if comparisons are made for the psychologically relevent groups.[2] Concerning Fable 1, if we selected out students with fragile self-images, we would expect, ex hypothesis, a stronger relationship between grading context and the output measure. Similarly for Fable 2,

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[1]Notice that we have also claimed that there are structural conditions which help produce the feeling of being an outsider.

[2]Our discussion necessarily glosses over the measurement and conceptual difficulties which beset the use of psychological variables. Much developmental and consultative work would doubtless be required for the successful integration of psychological variables in the format of process accounting.

differential relationships would be expected for those students initially prone to feel themselves to be outsiders as opposed to those likely to identify readily with classmates. Working with psychologically distinct groups will alter somewhat the investigation of equality of treatment since it is less reasonable to suppose that schooling should be equally successful for the psychologically maladapted. But equality of treatment seems less important in this respect than developing intelligent ways to match treatment modalities to client needs.[1] The purpose of monitoring would not be to insure equal treatment in the sense of identical effects from identical stimuli but rather to help teachers and administrators allocate students to those process situations most suitable for their psychological dispositions. Perhaps one of the reasons schools fail a large number of students is that they do not make available a variety of differing structures and, ipso facto, do not match students to these structures.

This analysis suggests that there is a natural bridge between a sociologist's concern with the impact of group structure and the educator's concern with the maximization of each student's potential. Educators are in a position to manipulate certain structural characteristics of groups: the mix of abilities, of sexes, of students of different ages, the extensiveness of letter grading, the performance bases of letter grading, the number of adults in a class, the size of the class, etc. These manipulations can only become intelligent educational treatments when students are sorted into structures that

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[1] c.f. discussion of inherent inequality in the beginning of this chapter, pp. 107-114.

are appropriate for them and this means structures likely to have beneficial reference group effects of some kind. At the moment we are almost completely ignorant of the possible impact of structural variations within schools. Hopefully the description of monitoring presented in this case study points the way to developing a measurement system capable of rectifying this ignorance.

In the final chapter we will consider the implications of the analysis in this section for the future development of school records monitoring. We will also discuss the general implications of monitoring data for the development of social theory.

CHAPTER VII

A SOCIOLOGICAL MODEL FOR SCHOOL ACCOUNTABILITY

What are the processes that transform human experience in the modern world? This study has addressed this question from the outset by developing a methodological model premised on the thesis that certain organizational structures affect their human participants in unanticipated and contrary ways. In a general sense, the subject of this study has not been Transurbia High School but rather all organizations whose major purpose is to socialize a participant class. Consistent with this, we have developed a specialized vocabulary and set of rules for assessing the impact of specified organizational activities. If we have demonstrated that it is possible to monitor the interaction between participants and the structure of activities (e.g. students and grading contexts), then we have shown that at least some of the transforming processes of modern society may be systematically studied and perhaps explained.

One of the intentions of this discussion is to draw attention to social engineering possibilities inherent in a data analysis system which point up effects of manipulatable organizational structures. However chilling the idea of planned manipulation may be, one must consider whether the unplanned consequences of organizational participation are more appealing. Analysis has indicated that low status students, most likely students with

certain unmeasured psychological dispositions, may do considerably less well in school than is necessary because they are exposed to process event conditions that are particularly ill-suited for them. It is hard to see that such instances of the mismatch of treatment and client need represent anything other than appalling examples of human waste. The impetus of school records monitoring is to challenge the inevitability of this kind of abuse: it is to advance the claim that social engineering is a better alternative than uninformed compliance in the sponsorship of obsure transformations of the human condition.

What is called here social engineering might more accurately be labeled a system of accountability. This would be in keeping both with the process accounting vocabulary employed throughout this study as well as with currently popular concerns of American educators.[1] Also, it is unnecessary and meaningless to employ the perjorative term social engineering to denote a set of activities which educators have always sought to do and which they have a popular mandate to do. Schools are expected to make our children better educated, better people--this kind of engineering job has always been demanded of them. Our thesis is that process accounting would help them do a better job.

Concern with student grouping and grading practices in the case study will broaden now to show the general form which a school accountability

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[1]The word "accountability" is used here in the direct sense of attaching values to items, in this case, goal realization estimates to process events. Whether this could be extended to the public policy arena in education or elsewhere--where discussion of political accountability centers--will not be considered.

system would take. This involves tying together many of the elements examined in detail in the case study, and it also entails demonstrating the close connection between sociological analysis and the general requirements of schools interested in maximizing the benefit to students stemming from their programs.[1]

A starting point for this model building is the observation that school records monitoring is distinguished from ordinary evaluation by its focus on allocation processes. Concealed in this remark is the image of the educator as one who maximizes educational gains by sorting students into structures that are most appropriate for them. If we accept this premise that the way to maximum organizational efficiency is to perfect the structural offerings of a school and the matching of students to these structures, then we will also accept an accountability model that focuses on issues related to student allocation.

Process accounting as demonstrated in this study does not deal with the full range of issues which a focus on allocation suggests. For example, as discussed briefly in the beginning of Chapter Six, an explicit evaluation of the overall effectiveness of the various process event structures could not be undertaken. As a result it is not possible to assess the extensiveness of distributive inequalities experienced by subgroups. We do not know then whether members of one subgroup tended to be underassigned to favorable

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[1]No attempt will be made to generalize beyond schools, though the basic similarity of organizations which process people has been stressed in this study. See discussion in Chapter One, pp. 4-8.

treatment settings because we do not have any way of assessing "favorableness" in this regard. Importantly, however, process accounting should facilitate this sort of analysis because it will encourage school administrators to experiment with structural forms and thereby provide control and experimental groups needed for actual evaluation. As it becomes possible to determine the overall effectiveness of various program options, it will also become possible to monitor distributive inequalities related to these.

Similarly, further development of process accounting could incorporate a more systematic examination of the relationship between the organizational goals of schools and the separate objectives of the various process events. This issue was sidestepped in the present study by the assumption that among students of equivalent talent, program objectives would be similar. Ignored then is the very difficult policy issue concerning the extent to which talented students should be disproportionately rewarded in a public bureaucracy.

But determining the ideal relationship between organizational structures and goals and providing an evaluation-type assessment of the actual connection is only a first phase of accountability. The basic function of the educator is to promote student adaptation not merely to witness it. For this reason, he requires an accountability system which will provide some basis for manipulating school structures and assigning students to these in ways which maximize the overall amount of educational gains for each distinct subgroup. Even if, for policy reasons, he may wish to especially promote the interests of one subgroup, he will do this best if he knows the optimal educational settings for all students in this group. In terms of our case

study analysis, even if the Transurbia educator really only wanted to promote the interests of talented students, he would still wish to better manipulate talented students of low status whom our analysis suggested were becoming unnecessarily disaffected with the school.

It is the thesis of this study that the process accounting system described herein represents a powerful method for determining the relative impact of process events on different student subtypes and that it may be expanded to explain these differential impacts. Assuming this to have been demonstrated in the case study and described methodologically in Chapter Three, we will now attempt to show the linkage between this kind of analytic capability and the educator's role. This will amount to showing that process accounting is a plausible component of an ideal school accountability system. In doing this, we will observe the close natural bond between the sociologist's interest in group effects and the educator's.

In the previous chapter we isolated two elements as primary to process accounting. Both, of course, relate directly to the allocation of students to groups. The first is the capability of discovering differential impacts associated with the participation of different subgroups in the same conditions of a given process event. In the case study, we found that low status students manifested different output profiles from their peers in high-graded English classes. The second is the capacity of monitoring to provide data suitable to test explanatory theses. We suggested what such data might be in connection with the explanatory fables in the case study. If an educator understands why particular groups work well for some students

and if he has a means to identify such students, he will be able to assign them to suitable groupings. Similarly, if he understands why certain process event experiences are ineffective for other student subgroups, he may be able to provide alternative structures, free from the disabling characteristics of existing arrangements. For example, speculatively, the Transurbia educator might make available less competitive process events such as ungraded classes. A point of interest, though, is that the educator must do more than make new structures available--he must sort the appropriate students into them. In a word, he must effectuate the optimal educational match of student to structure.

It is in this regard that the case study yields its most extensive and systematic implications. We described the effects of grading contexts on low status students as interactive contextual effects. This meant that there were properties of some of these students which disposed them to react in undesirable ways to the experience of particular classroom settings. Of course, there were also certain properties of the classroom--competitiveness, we surmised, was one. In relationship to a school accountability system, this analysis implies that there are two separate elements to be matched: student dispositions and structural properties.

With respect to student dispositions, the case study suggests that an adequate process accounting data file would include a great deal of individual-level data, i.e. attitudes, self-images, sociometric patterns,

values, etc.[1] Most of this kind of information is needed to classify students into psychologically (dispositionally) distinct groups in order to see if these differ in their reaction to the experience of process event conditions and, of course, to then provide identifying information on which to reallocate students to alternative structures as needed. Data are also needed to validate explanatory theses such as the fables. If validated, such explanations are likely to imply alternative structural arrangements. Validating explanations of process effects should have the same import as cost accounting analysis has in business which informs the manager why a product is showing a loss and therein usually suggests a remedy.

These implications may be summarized with somewhat greater specificity. For process accounting to develop into a useful method for producing understanding of process event effects, periodic self-reports from students will need to be collected. The minimum requirement in this regard would be for beginning and end of school year questionnaire administrations. These would yield the individual-level data described above and the repetition would provide a means for assessing changes over time. In addition, it would be highly desirable to administer biannual questionnaires to teachers in order to obtain more information concerning the structure of the classes. (Student reports might also be useful in this respect.) Process accounting would further benefit from the inclusion of classroom observational data, again for

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[1]Because our concern here is with the logic of accountability and not its practicality, we will not consider whether reliable psychological inventories are available nor whether they would remain reliable after repeated administrations to the same students.

purposes of characterizing the structural properties of the classroom.

Besides the need to acquire a vast amount of dispositional data on individual students, the need to develop useful characterizations of group structures stands out as a major requirement for a school accountability system. This amounts to saying that the educator needs to know what it is about a given structure which affects student subgroups differently. Is it competitiveness, the nature of the authority structure, or the size of the class which leads to a particular result? In its present state of development, sociological theory of reference groups contains few tested propositions linking specified characteristics of groups to reference group experiences.[1] Yet as monitoring leads educators to systematically vary group structures, and to measure the results, it may well provide a testing site for the development of sociological theory in this area.[2] Our discussion points up the need for the educator to invite and encourage the development of this theory. The sociologist is bounded by his discipline to investigate and seek to understand the emergent properties of groups. The conceptualization of the educator's role explicit in this accountability model shows this to be his responsibility also.

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[1] In Chapter Two, we suggested that the paucity of highly developed theory stemmed from the absence of scalar group property measures, c.f. pp. 28-32. The case study shows that failure to take into account dispositional properties of subgroups tends to suppress findings of structural effects. The absence of such findings has, perhaps, dampened interest in the development of reference group theory among sociologists.

[2] For the most part, educators have been extremely conservative in their experimentation with the properties of student groups. The ubiguity of the standard classroom--one adult and 30 students--testifies to this conservatism. Process accounting would doubtless encourage the development of alternative group structures.

A second major implication of this research then is to call attention to the measurement needs of the discipline of sociology. This implication may seem grandiose--that the innovation of systematic record keeping and extensive data collection procedures might substantially advance the development of social theory--but it can be very strongly argued. Indeed this claim is analogous to the assertion that physical theorizing would be spurred by the construction of large scale nuclear accelerators. The material of sociology is not atoms but social institutions and these have traditionally proven recalcitrant to data collection and measurement. The general uniformity of school procedures in America, their increasing acceptance of computerized bookkeeping procedures, the availability of social norms which favor experimentation in schools, the testing and measurement traditions of schools, all of these suggest the plausibility of schools as a prime site for innovating large scale social measurement systems. It seems clear to this researcher that little understanding of actual group processes is possible without the incorporation of measurement itself as a routine characteristic of groups. This is the object of process accounting.

The role of process accounting methodology as a component of a school accountability system is summarized in the diagram below. The top half of Diagram 7.1 sketches out the initial monitoring procedure in a very simplified form. It shows the identification of different subgroups (these would be dispositionally distinct typologies) and the gathering of their output measure profiles in reference to the experience of different process event

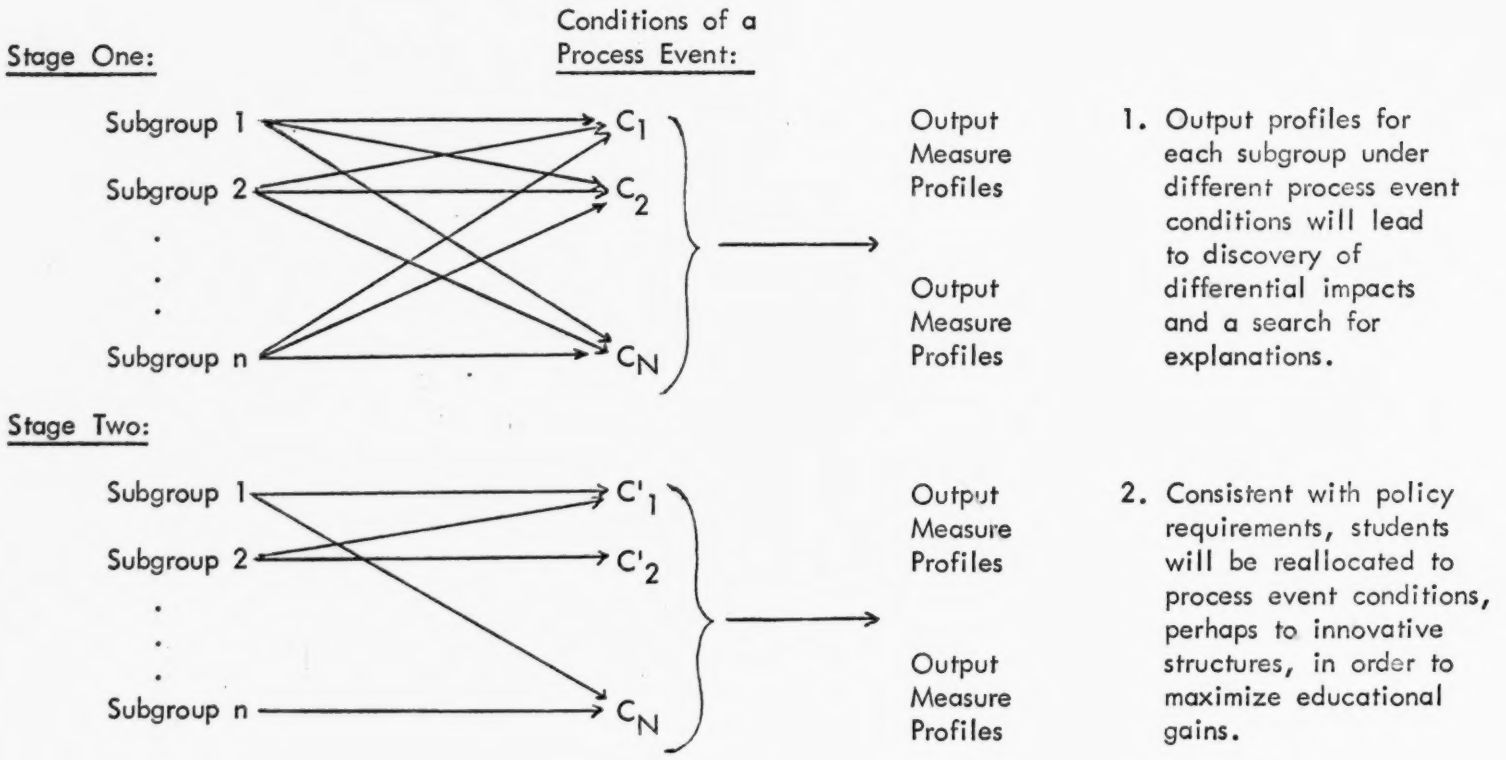
Stage One:
Conditions of a Process Event:
Subgroup 1
Subgroup 2
Subgroup n
C_1
C_2
C_N
Output Measure Profiles
Output Measure Profiles
1. Output profiles for each subgroup under different process event conditions will lead to discovery of differential impacts and a search for explanations.
Stage Two:
Subgroup 1
Subgroup 2
Subgroup n
C'_1
C'_2
C_N
Output Measure Profiles
Output Measure Profiles
2. Consistent with policy requirements, students will be reallocated to process event conditions, perhaps to innovative structures, in order to maximize educational gains.

Diagram 7.1

Two Stage Model for a School Accountability System Showing the Use of Process Accounting to Guide the Distribution of Students to Groups by (1) Assessing the Impact of Group Experience for Different Student Subgroups, and by (2) Explaining this Impact in a way which Leads to the Development of New Grouping Structures as Needed.

conditions. Presumably this initial monitoring would lead to the finding of some differential impact.[1] As a result of this and a result also of the analysis of the causes of this impact, students from the subgroups would be assigned to those conditions most suitable for them. New process event conditions might be provided if analysis suggested these were needed. The reassignment of students is shown in the bottom half of Diagram 7.1. Monitoring then continues under these new arrangements so that their effectiveness will also be assessed. The final distribution of students to groups shown in the bottom half of Diagram 7.1 will take into account policy choices which might cause the educator to favor students with certain characteristics.

When we first developed the vocabulary of people-processing organizations in Chapter One, we noted the disagreeable connotation that recipient class members such as students were held by this analogy to be passive. At that time we suggested that this implication would not affect our ability to use this heuristic vocabulary in a manner which featured students as highly interactive with school structure. In the course of this study we have propounded a rather complex schema for matching educational treatments to the needs of students as determined by a thorough and on-going monitoring of their psychological dispositions throughout the tenure of their school careers. In effect, we have indicted the usual manner of matching

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[1]This initial monitoring might be quite extensive since, in principle, there are many potential subgroups. The methodological discussion showed process accounting to be, logically, an iterative operation with respect to the substitution of different subgroups in the analysis, c.f. pp. 45-47.

students to treatments by claiming that it tends to treat alike all students having a particular characteristic, e.g. high ability. Ironically, we have used the arid vocabulary of industry to point up an alternative to this commonplace, insensitive, and ill-informed sorting of students into educational treatment groupings. This alternative is a sociological model of accountability for the school insofar as it rests on the premise that student groups have emergent, operative characteristics which affect student subgroups differently.

We have now considered some of the generalized potential of process accounting to aid in the development of social theory and to provide school administrators with relevant data for program assessments. These speculative considerations obviously disregard numerous realities of school organizations which mitigate against the rapid acceptance of this rather complex and revolutionary treatment of routine, school records data.[1] The additional needs of process accounting (chiefly student and staff questionnaires), which have been strongly urged in this chapter, clearly involve a significant commitment of resources and these further reduce the likelihood of willing acceptance by school systems which are increasingly cost conscious. Our concluding thoughts then concern some of the

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[1] In Chapter Three we suggested that the nature of program assessment in schools does not involve a detailed, scientific analysis of data but instead entails the manipulation of data to serve objectives generated by the political position of the school administrator, c.f. pp. 40-41. This implies that a rather severe reordering of the usual forms of administrative review will be required if process accounting is to be institutionalized in a meaningful way.

practical implications of this study with regard to the future development of process accounting.

Looking back over the generalized form and logical potential of process accounting as this was sketched out in Chapter Three, it seems quite clear that the case study analysis of Transurbia High School is only a very minimal demonstration of this method. Our premonitions are that school systems will not eagerly seek to institute process accounting without fairly compelling reasons to do so. In this circumstance, further development and testing of this methodology may be required in order to demonstrate its utility to school administrators and to the lay public.

A final implication of this study then is that a large scale, field test of process accounting should be instituted. This should involve an entire school system rather than a single high school, permitting a monitoring of patterns of behavior over extended intervals and relating process accounting to various transitional stages in the careers of students. For this study to prove or disprove the mettle of process accounting from the perspective of sound administrative practice, the willingness of the system's administrators to work with the research staff must be assured at the outset. Similarly, sufficient time must be allowed for the development of data collection and formating appropriate to the particular system and most importantly, patterns of integrating research and administrative staffs. Time will also be needed to develop appropriate patterns of data analysis. For these reasons, a five year field test may be the minimum interval adequate to develop a process accounting system that school administrators can actually use and thus directly

appreciate.

In sum, our conclusion here is that a full scale, working model of process accounting will probably be required to bring the merits of this methodology convincingly to the attention of educational decision-making bodies such as school boards. Many issues lie beyond this demonstration. For example, will process accounting be sufficiently generalizable so that demonstration districts could pass along the benefits of it to cooperating districts or is it a methodology which necessitates that each district innovate its own version? More importantly, perhaps, what safeguards will be needed to prevent the ill-advised use of this technique and nomenclature? An enormous amount of developmental work lies ahead for process accounting if it is truly as relevant and powerful an analytic tool as this study suggests.

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APPENDIX A

DATA COLLECTION AND ARRANGEMENT

This appendix deals with mechanical aspects of the transition from data in the field to the ordered work tape used in the computerized analysis of the case study. The remarks in this appendix are intended to give the discussion of sampling in Chapter Four an unambiguous, data base reference. It describes first the diverse information sources, then the procedures to render that material suitable for computer analysis; and finally it describes the arrangement of data on the work tape. Together with the discussion of typology constructions in Chapter Four, this discussion should allow the reader to know precisely how the data have been treated in the case study.

All the information included in the work tape pertains to individual students. Information from the students' permanent record cards was coded onto the School Records Code Sheet (see Appendix E). This information can be described on two levels: first as data fields and then as actual, available data. Referring to the School Records Code Sheet, data fields were created for father's occupation and education since this information was occasionally included in the school files. However, these data were generally <u>not</u> present so that the actual value of these fields is minimal. The transferring of school records' data onto the code sheet was accomplished during the original Transurbia project by a team of coders from Teachers College; this collection is described in an appendix to that project's

report.[1] Data fields in which useful information is available are limited to the following: "Lives with" (family structure), program, race, sex, class rank, participation in band or chorus, modal tenth and twelfth grade letter grades in major subjects, total absences for these years, eighth grade I.Q., SCAT tests, CEEB tests, and college plans for the Class of 1969 only. In addition to the SES data referred to above, among the more infertile data fields were all student grouping categories.

Grouping data were missing because classroom identifications were not carried on the permanent record cards. The apparent absence of grouping data led to a period of high trauma in the course of the original Transurbia research with the fortuitous result that a horde of course cards were discovered which contained a vast amount of grouping and grading information. Course registration cards were available on virtually all students enrolled in any Transurbia course during the years relevant for this study. These cards were separated by school class and year and within these divisions, they were arranged sequentially by the I.D. number of the student. Most students enrolled in eight or nine courses a year, counting minor subjects. Each course card had punched the course number, the teacher number, the period number, the days of the week the course met, the students' letter grade for each of the six marking periods as well as the student's name and I.D. number. Though classroom section numbers were not available, the teacher's

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[1]David E. Wilder and Alan S. Blumner, Some Sociological Aspects of Student Allocation in Two Racially Mixed Suburban High Schools (New York: Program for Situational Analyses, Teachers College, Columbia University, 1972, Appendix A).

I.D. number combined with the weekday and period number information provided a satisfactory alternative. In the original Transurbia research, only a small amount of this raw data, which consisted of more than 33,000 IBM cards, was processed.

For that study, grouping data were coded by hand on the Class of 1970 students at both Transurbia public high schools. English and Math classroom identifying information was abstracted as well as letter grades. The School Records Code Sheet provided one full IBM card of information; these hand-coded grouping data became part of a second card of school records' data. Included also on this second card was school attendance information; reading test scores obtained from English Department lists; junior high school English and Math grades as well as eighth grade attendance figures. This last information was collected at several of the feeder junior high schools only.

To supplement the school records' analysis in the original Transurbia study, a questionnaire was administered to Class of 1970 seniors at the two Transurbia high schools. Through a bizarre combination of snow and an unexpected student assembly, both the first and second administration of the questionnaire at Transurbia High School suffered an exceptionally high absence rate. (The questionnaire was completed during the English class periods so that the return rate should have exceeded 90%.) As a result, high absence rate students, those most likely to take advantage of inclement weather and impromptu assemblies, tend to be disproportionately underrepresented among the questionnaire respondents at Transurbia High School. Just 63% of the

students responded. For this reason, questionnaire data have not been incorporated into the case study of process accounting.

The work tape for the original study contained information on the Class of 1970 class cohort members only. The present study has built upon this primarily by extending the amount of grouping and grading information processed. The only new information collected specifically for this study has been some attendance figures and reading scores for the Class of 1969.

Most of the "new" data made available to the present study was machine-processed from the course cards. Separate data files were created for each grade year for both the 1969 and 1970 school classes. From each file, one IBM card of information was abstracted consisting basically of student I.D., course identifying and letter grade information for the following subject areas: English, Math, Science, Foreign Languages, and Social Studies. In addition, when a student took a second major course in the same subject area, letter grade and identifying information was recorded in a separate "extra course" field. Five of the eight class cohort grade years treated in the case study had attendance data available by marking period on a preface card to the course cards themselves. When this card was present, an annual attendance field was also calculated by summing the marking periods and noting, in still another field, the number of marking periods on which the attendance total was based. This procedure guarded against distortion from students entering Transurbia High at mid-year since these students could then be assigned a weighted, annual attendance figure.

As a result of these data manipulations, a maximum of four additional cards were produced on each student. To facilitate computer programming, dummy cards were produced so that any student attending fewer than four years would have a properly sequenced four card data set. This newly produced card set was in turn merged with a fifth card containing the additional attendance and reading score information chiefly on the Class of 1969.

Two distinctive sets of data were then available on the Classes of 1969 and 1970. The five card set in which all students having at least one course card set were represented and a four card set derived from the previous Transurbia project containing the School Records Code Sheet data, questionnaire data, etc.[1] The latter data set had a more comprehensive sampling frame since it was based on the School Records Code Sheet which in turn was based on a month-by-month searching of the Transurbia attendance ledgers for the Classes of 1969 and 1970, for all four grade years. When a student attended Transurbia High for only a few months, his course cards were sometimes pulled and destroyed so that the newly created five card data files were actually based on only a subsample of Transurbia High School attenders.

Despite this, the new five card data sets served as the basis for merging the original four card data sets. As a result, the nine card data

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[1]Actually the four card data set was available only for the Class of 1970; the School Records Code Sheet was available for the Class of 1969 and three dummy cards were appended to it to fill out the data sets, again for ease of computer programming.

sets (one for each school class) systematically eliminate students on whom no course identifying information was available. This is a trivial elimination since the independent variables for the case study require such data fields.

As a result of all the procedures described above, nine card data sets were made available on 667 members of the Class of 1969 and 695 members of the Class of 1970, including both white and black students. One data manipulation problem remained in order to make these data fields available for cross-tabular analysis using the SPSS computer program.[1]

This final manipulation concerned the treatment of the "extra course" field. Though relatively few students took two courses in the same subject area during the same school year, there was no correct way of designating which course to count if only one could be tabulated. To avoid the arbitrary elimination of data and to further develop the comprehensiveness of the design of process accounting, it was necessary to develop procedures to handle multiple subject area enrollments. The resulting procedure, which evolved after several false starts, treats only one extra course per student, per year. Thus for those few students with several extra courses in major subjects during a single school year, only the first course card encountered was treated as the extra course.

The following algorithyms were employed. Each student's nine card work tape file was searched: if a filled extra course field was encountered

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[1]Norman Nie, Dale H. Bent, and C. Hadlai Hull, Statistical Package for the Social Sciences (New York: McGraw-Hill Book Company, 1970).

in any of the first four cards, which contained the grouping information, the entire nine card set was reproduced with the following alterations: a code was used to designate the set as a replicate; each extra course field was substituted into the correct subject area field in the replicated set (a maximum of one substitution for each grade year); each of the first four cards in the replicated set having a substituted course also carried a code indicating which subject area had been substituted. This subject area code supplied the basis for the subsequent treatment of the data utilizing a sampling procedure. For example, if the subject for a table was to be ninth grade English, the sample consisted of all unreplicated data sets plus those sets with an English substituted course code in card one, the ninth grade grouping data card. Every grade level, subject area profile of classroom units in Appendix B is based on a different sampling frame in order to integrate appropriately the "extra course" students.

The physical manipulations discussed in this appendix made possible a fairly flexible and comprehensive treatment of grouping data. Much of the labor involved in setting up the school records monitoring case study consisted of data preparation as described herein. This appendix gives substance to the methodological description of monitoring in Chapter Three as the rearrangement of data into longitudinal files. This longitudinal arrangement contrasts sharply with the manner in which student information is normally stored at Transurbia High School. The usual isolation of data sets into school year groupings greatly impedes the analysis of school processes.

APPENDIX B

PROFILES OF CLASSROOM GROUPS

Preliminary Note:

This appendix relates directly to the discussion of student groups in Chapter Four.[1] Five hundred and ninety-six academic classes at Transurbia High School were monitored according to the characteristics of their students and the profiles are presented here. The sampling frame utilized for this purpose is described in Appendix A. It is comprehensive and includes both white and black students.

To facilitate this presentation, several abbreviating conventions have been employed. Each classroom has been assigned a code. The first digit of this code designates the grade level of the course - the number one standing for ninth grade, two for tenth grade, and so forth. In rare instances numbers beyond four appear as the first digit; these arbitrary codes indicate the course is remedial in nature. The second digit of the classroom code indicates the ability "track" of the course as explained in Chapter Four. The remaining digit(s) are arbitrary section numbers which serve to give each classroom a unique code.

In most instances the curriculum designation of the course is indicated above the code number: CP represents the College Preparatory program; GEN indicates the class receives either students in the General or Business programs; while BUS means the course is limited to students in the Business program. In the case of language courses, most of whose enrollees are in the College Preparatory program, the alphabetic abbreviations designate the language: FR is French; IT is Italian; SP is Spanish; GER is German; and LAT is Latin. Occasional alternative abbreviations are explained in the tables.

Immediately below the classroom codes are the final letter grades received by students in the class, except in twelfth grade courses where the third, or middle of the school year, marking period grade is employed. The particular grades employed are indicated by the mnemonics in the left hand columns of the appendices: ENGGR09 represents the ninth grade English grades; SCIGR10 stands for tenth grade science grades, and so forth. The distribution of letter grades is presented in absolute frequencies because these provide the bases for assignments to the grading context descriptor as discussed in Chapter Four.

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[1] See especially the discussion of Table 4.4, pp. 74-76.

The base number of students having letter grades is indicated in parentheses below the letter grade distribution. This number is a fair approximation of the total number of students in the class and it is used for this purpose throughout Appendix B. The various absence rate and standardized test score means, which appear below this number, are generally based on several fewer students. Their base numbers have been suppressed since it would have been difficult to read the tables had all the numbers been included.

Reading down the columns of Appendix B, between the base numbers and the context descriptors, are a variety of school attendance and test score means relative to the particular classes. The following mnemonics are employed: AB09, AB10, AB11, and AB12 represent the mean absence rates of the class for the school year indicated; IQ08 represents the class mean on the Lorge Thorndike I.Q. examination administered in the eighth grade throughout the Transurbia system; RD09, RD10, and RD11 represent class means on reading tests administered in March of the school years indicated and reported in grade equivalents; and LS09, MS09, LS11, and MS11 stand for the class mean on the language and mathematical components of the SCAT examinations administered in ninth and eleventh grade and reported here as nationally normed, percentile scores.

Several remarks are in order concerning the tests employed. Transurbia High School administered different reading test batteries to students in upper and lower ability English classes. The former classes were given the Nelson Denny reading test, which has a higher ceiling score, and the latter received the Gates-MacGinitie. Both tests claim to be valid measures of general reading level and comprehension. In this appendix, only class means on general reading level are reported. The SCAT scores (Cooperative School and College Ability Tests) were reported on the students' permanent record cards as confidence intervals with respect to national percentile norms. During the initial coding of school records, mid-point values were calculated and these provide the basis for the class means represented in Appendix B.

APPENDIX B.1 PROFILES OF CLASSROOM GROUPS: NINTH GRADE ENGLISH

Class of 1969:

Code:*	101	102	103	104	105	111	112	113	114	115	116	121	122	123	124	131	132	133	134	135	136	141
ENGGRO9:																						
A:	1	5	2	1	-	-	-	-	-	2	-	-	2	1	-	-	-	-	3	-	-	-
B:	6	4	6	9	5	6	6	6	3	1	7	-	10	4	-	-	2	4	5	4	2	1
C:	12	15	6	10	9	5	10	11	9	17	6	4	12	11	8	3	7	11	7	4	7	13
D:	5	-	6	4	13	7	9	11	13	9	11	12	1	2	11	8	5	5	4	5	6	3
E:	-	-	-	1	-	9	2	2	1	1	4	8	1	6	5	10	5	1	1	4	3	1
	(24)	(24)	(20)	(25)	(27)	(27)	(27)	(30)	(26)	(30)	(29)	(24)	(26)	(24)	(24)	(21)	(19)	(21)	(20)	(17)	(18)	(19)
ABO9:	10	8	8	12	12	17	11	12	7	13	17	19	17	16	21	22	21	14	18	15	18	14
IQ09:	114	115	116	116	117	102	104	103	101	102	104	95	92	93	92	89	88	89	94	86	91	-
RDO9:	11	11	11	11	11	9	10	9	9	10	9	8	8	9	8	8	7	8	8	7	8	7
LSO9:	70	70	77	78	80	50	47	49	50	48	51	37	30	39	30	13	19	26	26	20	19	21
MSO9:	60	63	59	65	68	36	49	29	37	42	32	29	35	33	27	33	27	16	23	13	19	17
Grade Context:	2	1	1	1	2	3	2	2	3	2	3	3	1	2	3	3	3	2	1	3	3	2
Ability Context:	2	2	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	4	5	4	5

Class of 1970:

Code:*	101	102	103	111	112	113	114	115	116	121	122	123	124	131	132	133	134	141	151	152	153	161	162
ENGGRO9:																							
A:	3	1	1	-	-	-	1	1	-	-	4	1	1	-	1	-	-	-	-	-	-	-	-
B:	6	3	8	6	4	-	6	6	3	4	8	8	-	2	6	2	1	3	2	9	1	1	1
C:	4	5	11	6	11	13	10	13	11	14	8	8	8	9	7	8	8	7	11	8	4	6	9
D:	3	7	-	6	8	10	5	4	9	4	3	6	7	7	1	5	7	5	3	3	10	3	6
E:	2	3	-	9	4	5	5	-	3	3	1	1	3	5	5	4	3	-	-	2	3	1	4
	(18)	(19)	(20)	(27)	(27)	(28)	(27)	(24)	(26)	(25)	(24)	(24)	(19)	(23)	(20)	(19)	(19)	(15)	(16)	(22)	(18)	(11)	(20)
ABO9:	10	12	8	15	21	14	22	7	19	14	17	20	19	25	31	14	21	15	16	18	24	19	29
IQ08:	124	116	114	105	108	107	106	110	108	101	101	105	100	97	96	99	95	85	89	94	90	85	84
RDO9:	12	11	11	11	9	10	9	9	9	9	8	8	8	9	8	8	8	5	7	7	7	6	6
LSO9:	85	75	79	60	54	61	60	58	61	44	43	40	35	32	37	35	30	15	23	24	22	16	19
MSO9:	63	47	62	32	37	40	42	41	42	33	37	24	25	21	25	28	23	18	16	20	15	19	14
Grade Context:	1	3	1	3	2	3	2	2	2	2	1	1	3	3	1	2	3	2	2	1	3	2	3
Ability Context:	1	2	2	3	3	3	3	3	3	3	4	4	4	4	4	4	4	5	5	5	5	5	5

*Note that English classrooms are not arranged by curriculum groupings in ninth grade. All these classrooms are officially designated as "English I."

APPENDIX B.2 ENROLLING OF CLASSROOM GROUPS: TENTH GRADE ENGLISH

Class of 1969:

Code:	CP 211	CP 212	CP 213	CP 221	CP 222	CP 223	CP 228	CP 231	CP 232	CP 233	CP 234	GEN 251	GEN 252	GEN 253	GEN 261	GEN 262	GEN 263	GEN 264	GEN 265	GEN 271	GEN 272	GEN 273	ENG* 291
ENGGR10:																							
A:	1	4	2	1	-	1	-	-	2	-	-	-	-	1	-	-	-	-	1	-	-	-	2
B:	6	5	7	14	4	11	9	5	5	5	3	2	6	5	4	3	1	1	8	-	3	-	2
C:	9	2	6	8	16	16	6	13	10	12	3	8	10	7	6	5	8	3	3	2	3	3	5
D:	4	9	3	2	7	3	5	8	4	5	10	7	4	10	11	5	5	9	2	6	5	7	1
E:	1	-	-	-	-	-	1	-	1	-	4	1	2	2	4	-	3	6	-	2	3	4	-
	(21)	(20)	(18)	(25)	(27)	(31)	(21)	(26)	(22)	(22)	(20)	(18)	(22)	(25)	(25)	(16)	(17)	(19)	(14)	(10)	(14)	(14)	(10)
ABO9:	7	13	10	7	8	7	10	14	9	9	7	9	12	12	10	11	8	16	12	12	10	17	11
AB10:	9	13	12	13	6	11	13	13	11	11	14	13	20	17	13	25	15	23	24	19	11	27	18
RD09:	11	12	12	10	11	10	10	9	9	9	9	9	9	10	8	8	8	8	8	6	7	7	7
RD10:	12	13	13	10	11	11	11	10	9	10	10	10	9	9	8	8	8	7	9	7	7	7	6
LS09:	80	77	80	56	59	55	59	39	43	50	50	47	41	43	36	28	30	35	38	16	21	19	18
MS09:	64	67	69	50	42	51	54	29	43	36	42	45	32	32	30	24	28	31	21	14	17	12	20
Grade Context:	1	2	1	1	2	1	1	2	2	2	3	2	2	2	3	2	2	3	1	3	3	3	1
Ability Context:	1	1	1	2	2	2	2	3	3	3	3	3	3	3	4	4	4	4	4	5	5	5	5

Class of 1970:

Code:	CP 201	CP 211	CP 212	CP 221	CP 222	CP 223	CP 228	CP 231	CP 232	CP 233	CP 234	CP 235	GEN 251	GEN 252	GEN 253	GEN 261	GEN 262	GEN 263	GEN 264	GEN 265	GEN 271	GEN 272	GEN 273	GEN 274
ENGGR10:																								
A:	5	1	1	-	4	1	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	-	-
B:	13	6	6	3	8	6	9	-	2	2	7	7	3	3	8	1	1	-	2	2	1	5	2	3
C:	1	6	13	5	7	8	9	6	8	7	9	7	10	11	6	6	4	7	2	3	5	6	10	3
D:	-	7	1	8	1	6	2	4	10	7	4	8	2	4	5	2	4	6	5	4	5	4	-	4
E:	-	2	1	6	3	1	1	2	3	4	2	-	3	2	4	4	6	3	1	5	3	1	3	-
	(19)	(22)	(22)	(22)	(23)	(22)	(21)	(12)	(23)	(20)	(22)	(22)	(19)	(21)	(23)	(13)	(15)	(16)	(10)	(14)	(14)	(15)	(15)	(11)
ABO9:	7	8	10	10	11	10	9	11	12	14	11	10	15	16	13	26	27	19	30	16	19	15	11	13
AB10:	10	12	12	20	13	17	19	24	18	22	21	17	24	20	25	37	39	30	42	23	23	19	20	21
RD09:	12	11	11	9	10	9	9	8	7	7	8	7	9	9	9	8	7	8	6	7	6	6	6	5
RD10:	13	11	13	10	10	10	10	9	9	9	10	-	9	9	10	8	8	8	9	8	7	7	7	-
LS09:	86	70	71	59	57	55	56	40	44	44	42	36	44	46	46	36	23	32	20	22	11	14	17	15
MS09:	69	50	57	34	40	42	36	24	35	35	31	23	24	28	39	13	15	10	9	17	11	15	12	17
Grade Context:	1	2	2	3	1	2	1	3	3	3	2	2	2	2	2	2	3	3	3	3	3	1	2	2
Ability Context:	1	1	1	2	2	2	2	3	3	3	3	4	3	3	3	4	4	4	4	4	5	5	5	5

*English class "291" does not pertain to a particular curriculum grouping.

APPENDIX D.3 FREQUENCY OF CLASSIFICATIONS: SELECTED GRADE RECORDS

Class of 1970:

Code:	CP 311	CP 312	CP 313	CP 321	CP 322	CP 323	CP 324	CP 325	CP 331	CP 332	CP 333	GEN 341	GEN 342	GEN 343	BUS 371	BUS 372	BUS 373	BUS 381	BUS 382	BUS 383
ENGGR11:																				
A:	9	3	2	1	1	1	4	-	-	-	1	-	-	1	-	-	1	-	-	-
B:	5	9	14	10	8	4	7	9	2	5	13	3	3	-	1	2	6	-	-	3
C:	5	8	4	10	10	6	9	7	11	9	9	8	10	4	8	4	11	5	6	6
D:	-	2	1	1	3	6	1	5	10	11	-	10	2	8	6	10	1	-	7	3
E:	2	1	-	-	-	6	1	2	3	-	2	-	2	7	6	4	1	5	1	1
	(21)	(23)	(21)	(22)	(22)	(23)	(22)	(23)	(26)	(25)	(25)	(21)	(17)	(20)	(21)	(20)	(20)	(10)	(14)	(13)
AB10:	7	13	10	7	7	8	12	12	10	12	11	12	16	21	21	14	18	22	12	11
AB11:	10	15	11	16	10	16	19	19	15	17	21	19	31	27	24	20	23	21	27	19
RD10:	13	12	12	10	11	11	11	11	9	9	9	8	9	7	9	9	9	7	8	8
LS09:	81	77	72	52	52	58	55	61	43	45	39	25	36	34	46	36	42	26	30	28
LS11:	78	73	77	43	49	51	54	53	36	30	35	19	23	18	33	26	30	18	17	18
Grade Context:	1	1	1	1	1	3	1	1	3	2	1	2	2	3	3	3	1	3	3	2
Ability Context:	1	1	1	2	2	2	2	2	3	3	3	4	4	4	3	3	3	4	4	4

Class of 1970:

Code:	CP 301	CP 311	CP 321	CP 322	CP 323	CP 324	CP* 331	CP 332	CP 333	CP 334	GEN 341	GEN 342	GEN 343	BUS 371	BUS 372	BUS 373	BUS 381	BUS 382
ENGGR11:																		
A:	8	-	-	1	3	-	-	-	-	-	-	1	-	-	-	-	-	-
B:	15	3	11	2	11	6	2	3	2	9	1	3	-	3	5	7	1	-
C:	4	11	9	14	13	11	10	6	7	12	5	8	4	5	10	6	4	5
D:	2	7	7	10	1	6	7	7	9	2	13	2	10	7	7	3	9	16
E:	-	2	-	3	-	6	2	8	1	-	1	1	7	6	-	1	6	3
	(29)	(23)	(27)	(30)	(28)	(29)	(21)	(25)	(19)	(23)	(20)	(15)	(21)	(21)	(22)	(17)	(20)	(24)
AB10:	8	12	12	17	14	15	14	18	19	16	30	18	18	15	24	26	23	26
AB11:	15	20	15	26	16	20	17	27	21	27	36	39	18	25	29	27	36	33
RD10:	13	12	11	11	11	10	9	9	9	9	7	7	7	10	10	10	8	9
RD11:	13	11	12	11	11	10	10	9	9	9	8	8	8	10	10	10	8	9
LS09:	79	70	67	56	58	51	41	40	41	38	17	17	27	34	47	37	25	19
LS11:	77	61	60	47	54	43	38	34	38	31	16	22	17	37	35	27	18	15
Grade Context:	1	2	1	2	1	2	3	3	3	1	3	2	2	3	2	1	3	3
Ability Context:	1	2	2	2	2	3	3	3	4	4	5	5	5	3	3	3	5	5

APPENDIX F.4 PROFILES OF CLASSROOM GROUPS: TWELFTH GRADE ENGLISH

Class of 1969:

Code:	CP 401	CP 411	CP 421	CP 422	CP 423	CP 424	CP 431	CP 432	CP 433	GEN 441	GEN 442	BUS 461	BUS 471	BUS 472	BUS 473	ENG* 551	BUS 601	BUS 602
ENGGR12:																		
A:	13	3	1	-	2	4	-	2	2	1	1	1	-	-	1	2	2	-
B:	5	20	7	5	6	14	2	7	5	1	1	4	-	2	1	1	4	4
C:	2	9	8	14	14	7	8	8	6	3	1	13	10	4	7	7	6	3
D:	-	1	7	6	3	2	15	3	10	10	11	6	10	8	9	11	6	8
E:	-	-	7	1	5	3	6	3	7	5	11	3	6	4	2	10	6	1
	(20)	(33)	(30)	(26)	(30)	(30)	(31)	(23)	(30)	(20)	(25)	(27)	(26)	(18)	(20)	(31)	(24)	(16)
AB11:	6	11	16	14	13	15	22	12	17	20	18	20	19	25	21	33	23	21
AB12:	10	15	25	20	18	21	25	16	23	32	31	36	25	36	27	48	32	26
RD10:	13	12	11	11	11	11	9	9	10	8	7	9	7	8	8	8	9	10
LS11:	86	76	51	51	52	53	33	35	36	20	16	28	17	25	18	33	25	37
MS11:	73	57	41	53	50	49	29	28	43	16	12	25	20	13	20	21	29	32
Grade Context:	1	1	2	2	2	1	3	1	3	3	3	2	3	3	3	3	3	2
Ability Context:	1	1	2	2	2	2	3	3	3	5	5	4	5	5	5	4	4	3

Class of 1970:

Code:	CP 401	CP 411	CP 412	CP 421	CP 422	CP 423	CP 431	CP 432	CP 433	CP 434	GEN 441	GEN 442	BUS 461	BUS 462	BUS 463	BUS 471	BUS 472	BUS 473	ENG* 551	ENG* 552
ENGGR12:																				
A:	8	2	4	-	-	2	-	-	8	-	-	-	-	1	3	1	1	-	-	-
B:	12	3	7	5	8	5	-	3	4	14	6	5	3	-	2	3	-	2	5	2
C:	3	12	4	8	17	9	3	3	9	4	6	6	9	4	12	2	2	4	2	3
D:	1	1	1	10	4	5	8	12	5	2	7	3	10	6	6	4	9	7	10	4
E:	-	-	-	2	1	5	11	7	4	6	2	3	4	2	1	12	6	2	2	7
	(24)	(18)	(16)	(25)	(30)	(26)	(22)	(25)	(30)	(26)	(21)	(17)	(26)	(13)	(24)	(22)	(18)	(15)	(19)	(16)
AB11:	11	15	12	14	14	21	15	23	17	23	30	26	20	49	24	31	26	25	40	47
AB12:	18	19	22	24	22	32	23	33	34	38	64	44	32	60	37	38	37	38	68	63
RD11:	13	12	13	11	11	11	9	9	10	10	8	8	10	9	10	9	9	8	8	10
LS11:	85	62	74	49	47	48	33	37	38	33	18	20	34	32	31	30	23	22	26	37
MS11:	66	46	50	38	40	36	22	26	32	28	17	15	27	27	34	29	17	12	17	40
Grade Context:	1	2	1	2	2	2	3	3	1	1	2	2	3	3	2	3	3	3	3	3
Ability Context:	1	2	2	3	3	3	4	4	4	4	5	5	4	4	4	4	5	5	5	3

*These particular English classes were not arranged according to curriculum groupings.

APPENDIX B.6 PROFILES OF CLASSROOM GROUPS: NINTH GRADE LANGUAGE

Class of 1969:

Code:	FR 101	FR 102	FR 103	IT 121	IT 122	SP 141	SP 142	SP 143	SP 151	SP 152	SP 153	SP 154	SP 155	SP 156	SP 157	SP 158	SP 159	GER 161	LAT 181	LAT 182
LNGGR09:																				
A:	1	1	1	4	1	1	2	2	1	1	-	-	2	-	-	2	-	5	1	-
B:	3	4	1	1	2	1	3	4	4	5	4	3	2	6	5	4	2	3	4	6
C:	5	6	2	7	2	7	3	6	8	3	10	5	4	11	4	2	4	5	8	7
D:	8	9	6	2	1	3	6	8	5	3	7	-	5	4	3	4	4	1	4	4
E:	2	1	5	1	1	2	2	3	2	1	-	-	4	2	1	3	4	-	1	1
	(19)	(21)	(15)	(15)	(7)	(14)	(16)	(23)	(20)	(13)	(21)	(8)	(17)	(23)	(13)	(15)	(14)	(14)	(10)	(18)
ABO9:	15	10	9	19	16	6	7	8	13	10	6	14	21	12	15	11	17	10	10	13
IQ08:	112	109	112	101	90	112	117	114	95	104	106	105	101	98	99	95	102	115	109	112
RD09:	11	10	11	9	8	11	11	11	9	10	10	9	9	9	9	8	9	11	11	10
LS09:	67	56	49	55	40	70	77	73	40	52	44	57	46	40	49	38	58	69	66	51
Grade Context:	3	2	3	1	1	2	3	2	2	1	2	1	3	2	1	2	3	1	2	1
Ability Context:	2	2	2	3	4	2	2	2	4	3	3	3	3	4	3	4	3	2	2	2

Class of 1970:

Code:	FR 1001	FR 1002	FR 1003	IT 1201	IT 1202	SP 1401	SP 1402	SP 1403	SP 1501	SP 1502	SP 1503	SP 1504	SP 1505	SP 1506	SP 1507	SP 1508	SP 1509	SP 1510	GER 1601	LAT 1701	LANG* 7701
LNGGR09:																					
A:	1	2	4	2	2	2	1	1	4	2	1	2	-	2	4	2	1	-	1	1	-
B:	5	-	6	-	2	1	1	6	1	2	1	5	1	2	1	2	4	2	4	4	-
C:	4	8	4	2	-	6	6	9	7	5	8	7	3	6	3	5	6	4	2	14	3
D:	4	6	2	1	3	1	4	2	6	2	3	4	6	4	6	6	5	6	-	6	10
E:	9	5	2	1	4	2	6	-	4	7	1	1	5	6	1	2	-	3	1	2	-
	(23)	(21)	(18)	(6)	(11)	(12)	(18)	(18)	(22)	(18)	(14)	(19)	(15)	(20)	(15)	(17)	(16)	(15)	(8)	(27)	(13)
ABO9:	9	11	11	37	37	15	15	9	15	17	18	15	17	12	11	21	11	14	21	14	21
IQ08:	108	109	106	110	94	116	112	109	100	98	103	101	100	101	104	104	104	100	109	115	94
RD09:	9	9	10	10	9	10	9	10	8	7	9	8	8	9	9	8	9	8	10	11	7
LS09:	53	55	58	59	39	68	74	55	49	34	38	46	45	52	52	51	43	41	69	71	36
MS09:	38	45	41	54	18	57	36	46	34	25	34	28	36	36	41	28	27	26	47	58	17
Grade Context:	3	3	1	2	2	2	3	1	2	3	2	1	3	3	2	2	2	3	1	2	3
Ability Context:	3	3	3	2	3	2	2	3	3	4	3	3	3	3	3	3	3	4	2	2	4

*Class "7701" was a general language course.

APPENDIX B.6 PROFILES OF CLASSROOM GROUPS: TENTH GRADE LANGUAGE

Class of 1969:

Code:	SP 181	SP 182	FR 201	FR 202	FR 203	IT 221	SP 221	SP 222	SP 223	SP 224	SP 231	SP 232	SP 233	SP 234	SP 235	GER 261	LAT 271	LAT 272
LNGGR10:																		
A:	3	2	-	-	4	1	3	2	8	7	-	-	4	-	5	-	-	
B:	2	2	2	1	4	4	4	4	3	5	4	2	6	5	1	3	4	
C:	1	-	3	3	4	2	11	10	9	4	4	5	6	1	1	8	5	
D:	3	4	5	9	1	2	5	4	4	3	3	9	3	6	3	3	10	
E:	1	1	3	1	3	2	-	3	-	-	2	-	-	1	1	-	-	
	(10)	(9)	(13)	(14)	(16)	(11)	(22)	(23)	(23)	(17)	(11)	(16)	(19)	(12)	(12)	(14)	(13)	
ABO9:	8	14	10	15	9	8	4	8	9	11	10	9	7	10	10	13	11	
AB10:	13	17	11	13	10	11	8	11	12	11	12	12	10	15	9	13	13	
RDO9:	10	9	11	10	10	9	10	11	10	9	9	9	9	9	11	12	11	
RD10:	11	9	11	12	11	10	11	11	11	10	10	10	10	9	12	12	11	
LSO9:	50	40	68	65	60	54	69	73	63	48	48	42	45	41	74	67	54	
MSO9:	35	33	63	44	54	53	55	57	50	38	34	34	43	43	62	68	52	
Grade Context:	1	2	3	3	1	1	2	2	1	1	2	3	1	2	1	2	3	
Ability Context:	3	4	2	2	2	3	2	2	2	3	3	3	3	4	2	2	3	

Class of 1970:

Code:	FR 201	FR 202	FR 203	IT 211	SP 221	SP 222	SP 223	SP 224	SP 231	SP 232	SP 233	SP 234	SP 235	SP 236	SP 237	LAT 251
LNGGR10:																
A:	1	3	1	-	-	2	1	-	-	2	3	3	-	1	2	1
B:	3	2	6	2	7	4	4	7	-	5	5	4	3	5	8	6
C:	6	2	6	3	8	5	7	2	5	2	5	4	7	7	2	12
D:	5	5	-	1	-	2	1	5	4	3	2	1	4	1	3	5
E:	-	-	-	3	-	-	-	1	-	-	-	1	-	-	-	-
	(15)	(12)	(13)	(9)	(15)	(13)	(13)	(15)	(9)	(12)	(15)	(13)	(14)	(14)	(15)	(24)
ABO9:	6	9	10	17	8	9	8	11	11	10	14	13	16	10	8	10
AB10:	11	14	14	24	11	14	14	15	23	11	21	22	20	14	11	12
RDO9:	10	10	10	10	9	9	9	9	7	9	9	9	9	9	8	11
RD10:	11	11	12	9	12	11	11	11	9	9	10	10	10	10	9	12
LSO9:	57	68	71	42	62	58	54	62	39	42	46	55	45	39	43	73
MSO9:	47	51	56	35	40	42	54	49	30	30	31	39	35	33	24	58
Grade Context:	2	2	1	2	1	1	1	1	2	1	1	1	2	1	1	2
Ability Context:	3	2	2	3	2	2	3	3	4	4	3	3	3	4	4	2

APPENDIX 5.7 PROFILES OF CLASSROOM GROUPS: ELEVENTH GRADE LANGUAGE

Class of 1969:

Code:	FR 301	IT 311	SP 321	SP 322	SP 323	GER 331	LAT 341
LNGGR11:							
A:	5	1	5	1	3	6	3
B:	5	4	8	10	5	-	7
C:	3	-	5	6	10	-	-
D:	-	1	3	1	-	-	-
E:	-	-	-	-	-	-	-
	(13)	(6)	(21)	(18)	(18)	(6)	(10)
AB10:	9	13	9	7	9	7	11
AB11:	10	19	17	21	10	9	11
RD10:	11	9	10	11	11	12	13
LS09:	62	28	55	50	67	76	77
LS11:	63	26	46	48	59	83	76
Grade Context:	1	1	1	1	1	1	1
Ability Context:	2	4	3	3	2	1	1

Class of 1970:

Code:	FR 301	SP 321	SP 322	SP 323
LNGGR11:				
A:	2	3	3	1
B:	5	2	7	3
C:	5	12	4	6
D:	1	2	2	5
E:	-	1	-	1
	(13)	(20)	(16)	(16)
AB10:	10	11	11	13
AB11:	15	17	11	16
RD10:	12	11	10	11
RD11:	12	11	10	10
LS09:	74	53	48	54
LS11:	64	45	35	60
Grade Context:	1	2	1	2
Ability Context:	2	3	3	3

APPENDIX 5.8 PROFILES OF CLASSROOM GROUPS: TWELFTH GRADE LANGUAGE

Class of 1969:

Code:	FR 401	IT 411	SP 421
LNGGR12:			
A:	4	4	2
B:	2	1	6
C:	2	-	6
D:	1	-	3
E:	-	-	-
	(9)	(5)	(17)
AB11:	15	23	13
AB12:	18	25	14
RD10:	12	8	11
LS11:	67	12	57
MS11:	37	7	47
Grade Context:	1	1	1
Ability Context:	2	4	3

Class of 1970:

Code:	FR 201	SP 321	SP 421
LNGGR12:			
A:	1	-	2
B:	4	2	5
C:	2	4	4
D:	1	-	-
E:	-	2	-
	(8)	(8)	(11)
AB11:	15	14	10
AB12:	25	32	16
RD11:	11	10	11
LS11:	69	35	51
MS11:	43	26	35
Grade Context:	1	2	1
Ability Context:	2	4	3

APPENDIX B.9 PROFILES OF CLASSROOM GROUPS: NINTH GRADE MATH

Class of 1969:

Code:	CP 101	CP 102	CP 103	CP 104	CP 105	CP 111	CP 112	CP 113	CP 114	CP 115	CP 116	CP 117	CP 118	CP 119	GEN 121	GEN 122	GEN 123	GEN 131	GEN 132	MAT* 141
MATGRO9:																				
A:	3	5	2	2	1	-	-	-	1	-	1	-	-	2	4	-	-	1	1	
B:	1	5	8	5	1	2	1	3	2	4	-	-	3	5	9	1	7	1	4	
C:	6	3	7	5	12	2	1	5	5	1	5	4	5	10	9	11	4	5	6	
D:	9	7	9	7	11	10	11	4	3	10	7	15	8	5	2	9	6	6	5	
E:	2	-	-	1	1	5	4	2	7	2	7	-	3	6	1	1	4	6	2	
	(21)	(20)	(26)	(20)	(26)	(19)	(17)	(14)	(18)	(17)	(20)	(19)	(19)	(28)	(25)	(22)	(21)	(19)	(18)	
ABO9:	9	5	10	9	13	11	11	10	18	8	11	12	15	20	15	12	17	15	14	
IQO8:	115	115	114	119	114	101	98	102	104	105	100	105	107	100	97	99	90	92	-	
RDO9:	11	11	11	11	11	10	9	10	9	10	9	9	9	9	9	9	7	8	7	
LSO9:	68	69	68	77	66	48	51	58	42	56	41	54	48	39	35	33	30	27	21	
MSO9:	67	69	54	72	60	43	34	47	36	45	38	32	41	36	32	37	20	19	17	
Grade Context:	3	1	1	2	2	3	3	2	3	3	3	3	3	2	1	2	2	3	2	
Ability Context:	2	2	2	2	2	3	3	3	3	3	3	3	3	4	4	4	5	5	5	

Class of 1970:

Code:	CP 101	CP 102	CP 103	CP 104	CP 111	CP 112	CP 113	CP 114	CP 115	CP 116	CP 117	CP 118	CP 119	GEN 121	GEN 122	GEN 131	GEN 132	GEN 133	GEN 134	MAT* 141
MATGRO9:																				
A:	3	1	1	4	-	-	-	-	-	-	-	-	-	4	-	-	-	-	-	1
B:	4	5	1	4	2	-	3	1	3	-	1	2	1	5	2	1	-	3	3	2
C:	3	5	5	4	4	6	2	3	6	8	8	6	13	7	9	7	9	5	5	5
D:	2	8	13	6	15	7	18	3	7	4	8	8	7	3	5	6	8	8	6	7
E:	7	3	5	1	3	4	2	3	4	6	10	5	-	2	2	1	-	2	6	-
	(19)	(22)	(25)	(19)	(24)	(17)	(25)	(10)	(20)	(18)	(27)	(21)	(21)	(21)	(18)	(15)	(17)	(19)	(20)	(18)
ABO9:	17	13	13	7	12	9	15	13	14	13	14	9	8	10	21	24	21	21	29	14
IQO8:	118	110	110	114	109	102	103	105	98	98	103	104	109	103	102	93	86	89	90	86
RDO9:	10	10	10	11	10	9	9	9	9	8	8	9	9	8	9	7	7	6	7	6
LSO9:	64	67	58	75	58	54	52	56	47	39	47	50	54	41	47	25	20	25	27	15
MSO9:	58	61	48	63	39	31	37	29	38	23	25	37	33	32	30	18	17	11	15	10
Grade Context:	2	3	3	1	3	3	3	3	3	3	3	3	2	1	2	2	2	3	3	2
Ability Context:	2	2	2	1	2	3	3	3	3	3	3	3	3	3	3	5	5	5	5	5

*These classes were not arranged according to curriculum groupings.

APPENDIX B.10 PROFILES OF CLASSROOM GROUPS: TENTH GRADE MATH

Class of 1969:

Code:	CP 111	CP 112	CP 113	CP 201	CP 211	CP 212	CP 213	CP 221	CP 222	CP 223	CP 224	CP 225	CP 226	GEN 231	GEN 232	MAT* 281
MATGR10:																
A:	-	-	-	6	2	2	3	-	-	1	-	1	-	-	-	1
B:	-	-	-	11	7	-	3	2	3	3	2	7	5	2	3	1
C:	1	4	2	4	4	7	12	3	2	11	8	9	8	3	7	7
D:	4	2	4	1	6	11	6	13	3	5	6	8	3	3	3	1
E:	3	7	1	1	3	4	4	-	11	-	-	1	2	1	2	-
	(8)	(13)	(7)	(23)	(22)	(24)	(28)	(18)	(19)	(20)	(16)	(26)	(18)	(9)	(15)	(10)
AB09:	7	13	11	5	10	8	9	6	9	8	17	8	10	14	8	11
AB10:	9	16	15	7	12	7	10	9	10	11	14	11	11	15	15	18
RD09:	8	9	8	12	11	10	11	9	10	10	9	10	10	7	8	7
RD10:	10	10	9	13	12	11	12	10	11	10	11	11	10	6	8	6
LS09:	38	48	37	79	70	58	70	52	50	52	49	56	64	19	22	18
MS09:	16	36	28	72	61	58	65	53	37	40	36	42	41	25	21	20
Grade Context:	3	3	3	1	2	3	2	3	3	2	2	2	2	2	2	2
Ability Context:	4	3	4	1	2	2	2	3	3	3	3	3	3	5	5	5

Class of 1970:

Code:	CP 111	CP 112	GEN 131	CP 201	CP 211	CP 212	CP 221	CP 222	CP 223	CP 224	CP 225	CP 226	CP 227	CP 228	GEN 231	GEN 232	GEN 233
MATGR10:																	
A:	-	-	-	7	-	4	-	-	-	-	-	-	-	-	-	-	-
B:	-	3	-	4	6	12	-	4	4	3	-	5	1	3	1	2	-
C:	-	4	-	5	10	5	2	5	7	3	6	8	7	9	4	3	6
D:	4	-	12	-	5	1	7	2	2	6	10	4	5	7	8	2	4
E:	4	3	2	-	2	-	4	-	5	-	3	4	1	1	4	3	3
	(8)	(10)	(14)	(16)	(23)	(22)	(13)	(11)	(18)	(12)	(19)	(21)	(14)	(20)	(17)	(10)	(13)
AB09:	15	17	19	5	10	10	8	7	10	12	11	11	5	13	18	16	28
AB10:	21	31	36	8	16	15	18	9	14	14	17	17	9	18	27	30	33
RD09:	8	9	6	11	10	10	9	10	9	10	9	9	9	8	7	6	7
RD10:	9	9	7	12	11	12	10	11	9	9	11	10	11	10	7	8	8
LS09:	55	43	18	75	64	73	53	62	46	59	57	52	50	52	20	24	33
MS09:	34	24	10	73	49	70	28	33	29	42	36	37	26	42	15	26	25
Grade Context:	3	2	3	1	2	1	3	1	2	3	3	2	2	2	3	3	3
Ability Context:	3	3	5	1	2	1	3	2	3	3	3	3	3	3	5	5	5

*This class was not arranged according to curriculum groupings.

APPENDIX F.11 PROFILES OF CLASSROOM GROUPS: ELEVENTH GRADE MATH

Class of 1969:

Code:	CP 301	CP 311	CP 312	CP 321	CP 322	CP 323	CP 324	GEN 331	CP 411	MAT* 431	MAT* 432	MAT* 433	MAT* 434
MATGR11:													
A:	3	1	2	1	1	-	-	-	1	-	-	1	-
B:	11	5	2	3	2	4	1	-	9	1	2	1	5
C:	8	4	11	11	8	2	1	3	3	11	7	9	8
D:	1	5	4	2	3	7	7	3	-	1	4	3	2
E:	-	1	-	3	2	5	-	-	-	1	-	-	-
	(23)	(16)	(19)	(20)	(16)	(18)	(9)	(6)	(13)	(14)	(13)	(14)	(15)
AB10:	7	8	9	7	7	13	8	16	5	11	11	14	10
AB11:	7	14	10	13	12	17	19	16	6	18	19	23	16
RD10:	13	12	12	11	11	11	10	5	13	10	11	11	11
LS09:	76	73	68	55	57	55	62	15	82	34	55	55	62
LS11:	78	69	65	55	59	50	47	17	77	29	51	33	65
Grade Context:	1	2	2	2	2	3	3	3	1	2	2	2	1
Ability Context:	2	2	2	3	3	3	3	5	1	4	3	3	3

Class of 1970:

Code:	CP 221	CP 222	GEN 231	GEN 232	GEN 233	CP 301	CP 311	CP 312	CP 321	CP 322	CP 323	CP 324	CP 325	CP 326	GEN 331	GEN 341	CP 421	MAT* 441	MAT* 442	MAT* 443
MATGR11:																				
A:	-	-	1	-	-	2	1	3	-	2	1	-	-	1	-	-	1	-	-	-
B:	1	1	2	1	3	6	3	1	4	1	1	4	4	1	2	3	7	2	3	4
C:	1	1	1	2	2	7	6	4	-	2	2	9	2	5	6	3	1	1	4	8
D:	3	3	3	3	2	1	5	5	7	10	4	-	3	6	-	1	-	7	3	1
E:	5	3	2	2	-	1	2	4	2	3	4	-	1	3	-	-	-	1	-	1
	(10)	(8)	(9)	(8)	(7)	(17)	(17)	(17)	(13)	(18)	(12)	(13)	(10)	(16)	(8)	(7)	(9)	(11)	(10)	(14)
AB10:	29	23	14	35	43	9	9	10	9	14	9	13	19	13	17	45	7	11	10	14
AB11:	36	30	26	43	47	16	15	17	22	14	16	14	31	19	35	50	7	14	12	20
RD10:	9	9	7	7	7	13	12	11	10	11	10	11	11	10	8	9	12	10	10	10
RD11:	11	9	9	8	8	13	12	11	10	11	11	11	12	10	8	9	13	9	10	10
LS09:	47	49	22	33	30	76	70	64	52	65	49	52	57	54	26	22	81	49	52	45
LS11:	45	43	26	28	19	78	67	60	39	61	42	51	49	39	34	33	80	39	46	32
Grade Context:	3	3	2	3	1	1	2	3	3	3	3	2	2	3	2	1	1	3	2	2
Ability Context:	3	3	5	5	5	1	2	2	3	2	3	3	3	3	5	5	1	4	3	3

*These classes were not arranged according to curriculum groupings.

APPENDIX F.12 PROFILES OF CLASSROOM GROUPS: TWELFTH GRADE MATH

Class of 1969:

Code:	CP 321	CP 322	CP 323	CP 324	CP 325	CP 326	GEN 331	GEN 341	GEN 342	GEN 343	GEN 344	GEN 345	CP 401	CP 411	CP 412	CP 421	CP 431	MAT* 441	MAT* 442	MAT* 443
MATGR12:																				
A:	-	-	-	-	-	-	-	11	10	-	-	-	4	5	3	2	4	1	1	-
B:	1	1	3	3	2	2	1	6	3	4	1	3	11	4	2	6	3	2	-	1
C:	2	2	2	3	4	1	7	6	4	3	3	9	7	1	5	-	3	2	4	2
D:	8	1	3	8	3	4	4	2	-	5	9	4	2	8	5	-	-	4	4	3
E:	2	1	3	1	4	3	-	1	-	2	5	-	1	1	4	-	-	2	-	2
	(13)	(5)	(11)	(15)	(13)	(10)	(12)	(26)	(17)	(14)	(18)	(16)	(25)	(19)	(19)	(8)	(10)	(11)	(9)	(9)
AB11:	14	14	22	13	16	15	23	21	19	23	38	25	11	7	14	11	7	20	11	23
AB12:	14	17	34	21	21	21	41	27	24	49	52	33	12	11	19	11	11	27	17	27
RD10:	11	9	11	9	10	10	9	9	8	7	8	7	12	12	12	12	13	9	9	11
LS11:	40	27	50	34	36	54	26	31	22	21	14	18	69	68	59	60	86	32	40	48
MS11:	37	29	27	35	38	39	15	24	18	8	11	13	70	61	66	84	84	29	17	37
Grade Context:	3	2	3	3	3	3	2	1	1	3	3	2	1	2	2	1	1	3	2	3
Ability Context:	3	4	3	4	4	3	5	4	5	5	5	5	2	2	2	2	1	4	4	3

Class of 1970:

Code:	GEN 341	GEN 342	GEN 343	GEN 344	CP 401	CP 411	CP 412	CP 431	MAT* 441	MAT* 442	MAT* 443
MATGR12:											
A:	4	2	4	6	4	1	1	1	1	3	4
B:	8	2	5	3	6	6	3	6	3	1	2
C:	3	4	6	3	3	7	5	4	4	3	1
D:	4	1	-	2	2	3	7	-	3	-	1
E:	3	3	1	1	-	6	3	-	-	1	2
	(22)	(12)	(16)	(15)	(15)	(23)	(19)	(11)	(11)	(8)	(10)
AB11:	25	43	38	26	7	15	15	10	24	8	25
AB12:	40	64	61	38	12	29	30	18	35	41	39
RD11:	9	8	9	9	12	11	11	13	9	11	11
LS11:	20	17	24	27	73	54	57	76	36	54	50
MS11:	14	13	10	18	60	48	50	74	15	24	25
Grade Context:	1	2	1	1	1	2	3	1	1	1	1
Ability Context:	5	5	5	5	1	3	3	1	4	3	3

*These classes were not arranged according to curriculum groupings.

APPENDIX B.13 PROFILES OF CLASSROOM GROUPS: NINTH GRADE SCIENCE

Class of 1969:

Code:*	CP 1001	CP 1002	CP 1003	CP 1004	CP 1005	CP 1006	CP 1007	GEN 1001	GEN 1002	GEN 1003	GEN 1004	GEN 1005	GEN 1006	GEN 1007	GEN 1008	GEN 1009	GEN 1010	GEN 1011	GEN 1012	SCI 1401
SCIGR09:																				
A:	1	4	2	-	4	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B:	4	1	3	4	4	5	3	-	1	3	-	1	3	-	2	1	-	1	2	5
C:	8	5	10	9	14	15	7	7	6	5	1	7	6	8	9	12	8	13	9	9
D:	12	7	9	6	5	4	13	9	9	12	2	9	7	4	9	5	4	9	9	2
E:	2	8	3	2	-	1	1	4	5	2	4	3	3	4	2	5	5	-	2	1
	(27)	(25)	(27)	(21)	(27)	(27)	(24)	(20)	(21)	(22)	(7)	(20)	(19)	(16)	(22)	(23)	(17)	(23)	(22)	(18)
ABO9:	12	9	11	10	12	11	9	22	17	20	24	20	16	18	21	16	24	14	13	14
IQ08:	110	108	110	111	113	114	101	92	96	101	96	93	94	93	94	94	95	94	96	-
RD09:	10	10	10	10	11	11	9	8	8	9	8	8	8	8	8	8	9	8	8	7
LS09:	63	55	57	60	73	66	44	35	34	41	21	32	40	37	30	32	30	30	38	21
MS09:	53	43	44	47	63	69	46	27	21	29	18	31	26	16	29	26	16	34	29	17
Grade Context:	3	3	2	2	2	2	3	3	3	3	3	3	3	3	3	2	3	2	3	1
Ability Context:	2	2	2	2	1	1	3	4	4	3	4	4	4	4	4	4	4	4	4	5

Class of 1970

Code:*	CP 101	CP 102	CP 103	CP 104	CP 105	AER 111	AER 112	AER 113	GEN 121	GEN 122	GEN 123	GEN 124	GEN 125	GEN 126	GEN 127	SCI 141
SCIGR09:																
A:	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-
B:	3	3	6	9	7	4	3	5	3	3	2	4	1	-	1	1
C:	4	5	5	11	11	11	14	15	3	8	7	7	8	2	9	3
D:	12	11	11	7	11	3	5	3	8	3	12	4	7	8	12	8
E:	5	4	4	1	1	5	3	1	9	4	5	1	4	6	3	3
	(24)	(24)	(27)	(30)	(30)	(23)	(25)	(24)	(23)	(18)	(26)	(16)	(20)	(16)	(26)	(15)
ABO9:	10	12	11	9	13	15	30	22	33	23	26	27	21	16	18	15
IQ08:	106	108	109	111	104	91	96	95	94	97	99	99	96	100	99	85
RD09:	9	10	9	10	9	7	8	7	8	8	8	7	8	8	8	5
LS09:	54	59	62	60	44	26	30	30	37	40	40	41	38	37	40	15
MS09:	46	49	36	43	35	18	21	17	25	30	21	28	28	26	22	18
Grade Context:	3	3	3	1	2	2	2	2	3	2	3	2	3	3	3	3
Ability Context:	2	2	2	2	2	4	3	4	3	3	3	3	3	3	3	5

*Courses with curriculum designations are basic science courses; those with the the "SCI" label are basic skills courses in science; and those with the label "AER" are aerospace science courses.

APPENDIX B.14 PROFILES OF CLASSROOM GROUPS: TENTH GRADE SCIENCE

Class of 1969:

Code:*	BSCS 201	CP 211	CP 212	CP 213	CP 214	CP 215	CP 216	CP 217	CP 218	CP 219	GEN 241	GEN 242	GEN 243	GEN 244	GEN 245	GEN 246	BIO 281
SCIGR10:																	
A:	9	1	1	4	-	1	-	-	1	-	-	-	-	1	-	-	-
B:	7	4	3	4	3	5	5	3	2	4	5	4	3	3	-	1	-
C:	3	9	13	8	6	6	12	8	8	15	10	11	6	10	4	5	6
D:	-	9	4	7	13	7	5	5	12	9	10	5	6	5	14	12	4
E:	1	1	1	6	5	-	3	4	3	-	1	1	3	2	5	3	-
	(20)	(24)	(22)	(29)	(27)	(19)	(25)	(20)	(26)	(28)	(26)	(21)	(18)	(21)	(23)	(21)	(10)
AB09:	5	11	8	8	8	11	9	9	11	11	15	18	17	12	13	9	11
AB10:	6	16	8	9	12	14	12	9	12	13	22	21	29	17	16	14	18
RD09:	13	11	10	10	10	10	10	9	10	9	8	8	7	8	8	8	7
RD10:	13	11	10	11	11	10	10	10	11	10	7	8	8	8	7	8	6
LS09:	86	67	54	51	59	48	58	43	61	54	38	33	37	32	18	28	18
MS09:	82	45	54	44	45	41	48	50	47	37	17	21	33	20	14	30	20
Grade Context:	1	2	2	2	3	2	2	2	3	2	2	2	3	2	3	3	2
Ability Context:	1	2	2	2	2	2	2	3	2	3	4	4	4	4	5	4	5

Class of 1970:

Code:*	BSCS 201	BSCS 211	BSCS 212	BSCS 213	CP 221	CP 222	CP 223	CP 224	CP 225	CP 226	CP 227	GEN 241	GEN 242	GEN 243	GEN 244	GEN 245	GEN 246	GEN 247
SCIGR10:																		
A:	4	2	1	1	1	-	1	-	1	-	-	1	-	-	-	-	-	-
B:	8	2	4	8	3	1	6	1	5	2	3	3	4	4	2	2	-	-
C:	1	10	10	8	4	5	11	12	2	12	9	5	3	2	5	6	2	3
D:	-	9	9	4	7	6	3	7	16	8	6	7	8	11	12	5	7	7
E:	-	4	1	-	1	5	1	1	2	1	6	1	2	8	6	4	11	11
	(13)	(27)	(25)	(21)	(16)	(17)	(22)	(21)	(26)	(23)	(24)	(17)	(17)	(25)	(25)	(17)	(20)	(21)
AB09:	6	14	9	8	14	12	8	9	10	12	10	21	27	17	18	22	13	19
AB10:	9	21	21	11	21	23	14	18	16	19	20	31	42	27	27	30	19	25
RD09:	12	10	11	10	9	8	9	9	9	8	8	7	8	7	7	8	7	7
RD10:	13	11	12	11	10	9	10	9	10	10	10	7	8	9	7	8	8	9
LS09:	81	71	76	61	60	42	50	41	51	44	46	22	32	34	24	27	27	19
MS09:	66	57	58	58	27	30	31	30	36	26	34	13	16	20	21	18	16	19
Grade Context:	1	2	2	1	3	3	2	2	3	2	3	2	3	3	3	3	3	3
Ability Context:	1	2	2	2	3	3	3	3	3	3	3	5	4	4	5	5	5	5

*All tenth grade science classes are biology courses. BSCS Biology employs a specially designed curriculum and most of its students are in the College Preparatory program. The class labeled "BIO" is not grouped according to curriculum.

APPENDIX B.15 PROFILES OF CLASSROOM GROUPS: ELEVENTH GRADE SCIENCE

Class of 1969:

Code:*	PSSC 301	PSSC 302	PSSC 303	PSSC 304	GEN 321
SCIGR11:					
A:	-	3	3	-	-
B:	8	2	2	-	1
C:	4	5	5	16	6
D:	4	5	9	5	3
E:	1	3	1	-	2
	(17)	(18)	(20)	(21)	(12)
AB10:	6	11	11	10	19
AB11:	9	18	13	12	32
RD10:	12	12	12	10	9
LS09:	72	77	71	53	36
LS11:	71	74	65	52	32
Grade Context:	1	2	3	2	2
Ability Context:	2	2	2	3	4

Class of 1970:

Code:*	PSSC 301	PSSC 302	PSSC 303	PSSC 304	GEN 321
SCIGR11:					
A:	-	-	1	2	1
B:	4	1	3	2	1
C:	6	2	9	12	5
D:	4	7	7	12	4
E:	2	3	1	1	3
	(16)	(13)	(21)	(29)	(14)
AB10:	20	14	11	12	26
AB11:	18	27	14	19	49
RD10:	11	10	12	11	8
RD11:	11	11	11	12	9
LS09:	73	56	64	66	26
LS11:	63	44	59	58	29
Grade Context:	2	3	2	2	3
Ability Context:	2	3	2	2	4

*All eleventh grade science courses are in physics. PSSC Physics employs a specially designed curriculum and most of its students are in the CP program.

APPENDIX B.16 PROFILES OF CLASSROOM GROUPS: TWELFTH GRADE SCIENCE

Class of 1969:

Code:**	CP 401	CP 402	CP 403	CP 404	CP 405	CP 406	CP 407	CP 408	GEN 421
SCIGR12:									
A:	-	3	1	-	3	4	2	-	2
B:	5	3	-	-	8	1	5	2	1
C:	8	7	6	8	6	11	11	5	4
D:	6	9	11	8	5	6	5	10	3
E:	6	4	6	2	3	3	-	2	8
	(25)	(26)	(24)	(18)	(25)	(25)	(23)	(19)	(18)
AB11:	12	15	16	14	9	10	13	16	20
AB12:	16	20	25	19	12	15	19	24	31
RD10:	11	12	10	10	12	11	11	11	8
LS11:	52	62	45	44	65	54	53	59	19
MS11:	50	55	40	44	66	47	45	46	12
Grade Context:	2	3	3	3	1	2	2	3	3
Ability Context:	2	2	3	3	2	2	3	2	4

Class of 1970:

Code:**	CP 401	CP 402	CP 403	CP 404	CP 405	CP 406	CP 407	CP 408	GEN 421
SCIGR12:									
A:	4	1	-	-	3	-	1	-	2
B:	4	-	-	-	1	1	1	1	2
C:	5	7	4	7	6	8	4	5	3
D:	6	6	7	8	4	12	4	11	4
E:	6	7	6	5	12	2	5	6	2
	(25)	(21)	(17)	(22)	(26)	(23)	(15)	(23)	(13)
AB11:	13	15	17	18	10	17	15	23	24
AB12:	23	25	26	29	22	27	29	39	33
RD11:	12	10	10	11	12	11	9	10	10
LS11:	66	51	41	50	60	50	42	45	35
MS11:	51	45	40	42	45	27	33	41	18
Grade Context:	2	3	3	3	3	3	3	3	2
Ability Context:	2	3	3	3	2	3	3	3	4

**All twelfth grade science courses are in chemistry.

APPENDIX B.17 PROFILES OF CLASSROOM GROUPS: NINTH GRADE SOCIAL STUDIES

Class of 1969:

Code:*	CP 101	CP 102	CP 103	CP 104	CVG 121	CVG 122	CIV 141
SOCGR09:							
A:	1	2	1	3	2	2	-
B:	4	7	8	6	8	6	4
C:	5	3	10	4	4	9	10
D:	10	7	2	7	6	3	3
E:	4	7	-	2	2	4	1
	(24)	(26)	(21)	(22)	(22)	(24)	(18)
ABO9:	8	10	7	11	19	19	14
IQ08:	111	111	102	107	92	92	-
RDO9:	10	10	10	10	8	8	7
LSO9:	65	59	50	57	27	34	21
MSO9:	54	55	49	39	16	23	17
Grade Context:	3	2	1	2	1	1	2
Ability Context:	2	2	3	3	4	4	5

Class of 1970:

Code:*	CP 101	CP 102	CP 103	CP 104	CP 105	CP 106	CVG 121	CIV 141
SOCGR09:								
A:	-	1	1	-	1	2	1	-
B:	2	6	6	3	3	4	1	3
C:	5	8	10	8	5	7	11	11
D:	5	8	7	4	7	6	9	-
E:	8	-	-	5	5	6	5	1
	(20)	(23)	(24)	(20)	(21)	(25)	(27)	(15)
ABO9:	21	16	7	14	7	13	25	17
IQ08:	104	105	105	105	108	110	92	85
RDO9:	10	10	9	9	9	9	8	5
LSO9:	54	61	50	52	59	55	35	15
MSO9:	36	46	41	34	39	43	28	18
Grade Context:	3	2	2	2	3	2	3	2
Ability Context:	2	2	2	2	2	2	4	5

*College Preparatory social studies courses in ninth grade consisted of world history; "CVG" stands for civics-geography and "CIV" for civics - neither of these courses was arranged by curriculum groupings.

APPENDIX B.18 PROFILES OF CLASSROOM GROUPS TENTH GRADE SOCIAL STUDIES

Class of 1969:

Code:**	GEN 201	GEN 202	GEN 203	GEN 204	GEN 205	WG 221	WH 281
SOCGR10:							
A:	-	1	-	-	-	-	-
B:	-	2	1	2	-	1	5
C:	4	1	5	10	8	5	4
D:	10	12	13	5	9	3	1
E:	2	3	2	3	7	3	-
	(16)	(19)	(21)	(20)	(24)	(12)	(10)
ABO9:	19	14	12	15	13	20	11
AB10:	30	18	25	15	18	31	18
RDO9:	8	8	8	8	7	7	7
RD10:	8	9	7	9	7	7	6
LSO9:	18	36	20	31	25	28	18
MSO9:	18	34	12	31	15	8	20
Grade Context:	3	3	3	2	3	3	1
Ability Context:	5	4	5	4	5	5	5

Class of 1970:

Code:**	GEN 201	GEN 202	GEN 203	GEN 204	WG 221
SOCGR10:					
A:	-	-	-	1	-
B:	-	1	1	5	4
C:	3	4	9	4	5
D:	6	6	9	9	1
E:	7	9	7	4	2
	(16)	(20)	(26)	(23)	(12)
ABO9:	19	28	18	19	22
AB10:	25	47	27	26	33
RDO9:	7	7	7	7	6
RD10:	9	8	8	7	8
LSO9:	27	25	27	20	23
MSO9:	16	14	17	20	19
Grade Context:	3	3	3	3	1
Ability Context:	5	5	5	5	5

**General social studies courses in tenth grade consisted of world history; "WG" stands for world geography and "WH" for world history, neither arranged by curriculum groupings.

APPENDIX B.10 PROFILES OF CLASSROOM GROUPS: ELEVENTH GRADE SOCIAL STUDIES

Class of 1969:

Code:*	AP 301	CP 311	CP 312	CP 313	CP 314	CP 321	CP 322	CP 323	CP 324	CP 325	GEN 341	GEN 342	GEN 343	GEN 344	GEN 345	GEN 346	GEN 347	GEN 348	GEN 349	ML 361	ML 362	ML 363
SOCGR11:																						
A:	6	2	3	2	-	1	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	-
B:	14	12	10	10	5	3	4	16	3	4	5	-	1	2	4	1	-	2	1	6	-	1
C:	3	7	6	9	4	19	8	8	18	14	8	5	1	9	4	9	8	6	7	1	4	5
D:	-	-	-	5	6	4	14	8	3	7	12	13	8	15	8	2	7	4	17	1	7	6
E:	-	1	2	-	9	3	-	-	1	-	3	5	3	5	-	4	1	1	-	1	-	2
	(23)	(22)	(21)	(26)	(24)	(30)	(26)	(27)	(25)	(25)	(28)	(23)	(13)	(31)	(18)	(16)	(16)	(13)	(25)	(9)	(11)	(13)
AB10:	6	14	11	10	12	9	13	8	11	7	14	17	15	18	19	31	17	25	17	14	29	20
AB11:	6	22	13	14	16	17	21	15	17	13	23	25	19	25	29	38	22	44	19	20	39	23
RD10:	13	10	11	12	12	10	9	10	10	10	9	8	9	8	8	8	8	8	8	9	9	9
LS09:	85	52	67	70	72	46	48	53	48	44	37	33	42	33	41	30	31	24	28	40	30	47
LS11:	83	49	62	65	69	39	37	39	39	46	26	26	33	23	25	22	30	26	20	44	24	36
Grade Context:	1	1	1	1	3	2	3	1	2	2	3	3	3	3	2	2	3	2	3	1	3	3
Ability Context:	1	2	2	2	2	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	3

Class of 1970:

Code:*	AP 301	CP 311	CP 312	CP 313	CP 321	CP 322	CP 323	CP 324	CP 325	CP 326	GEN 331	GEN 332	GEN 333	GEN 334	GEN 335	GEN 336	GEN 337	GEN 338	ML 361	ML 362
SOCGR11:																				
A:	3	-	5	3	-	-	1	1	1	-	1	1	-	-	-	1	1	-	-	-
B:	14	10	17	8	7	-	7	6	8	4	4	3	7	6	1	2	5	4	1	11
C:	2	14	6	8	13	14	8	12	11	10	4	5	14	2	12	10	8	2	6	7
D:	-	2	-	4	6	4	2	8	7	4	8	9	5	5	13	7	13	8	2	6
E:	-	2	-	2	2	1	-	2	4	1	2	-	2	6	5	3	4	2	1	1
	(19)	(28)	(28)	(25)	(28)	(19)	(18)	(29)	(31)	(19)	(20)	(18)	(28)	(19)	(31)	(23)	(31)	(16)	(10)	(25)
AB10:	8	13	12	12	18	12	13	16	18	22	28	34	19	26	23	25	32	21	15	24
AB11:	14	20	16	19	22	24	21	18	22	35	41	45	23	43	33	33	42	39	30	28
RD10:	13	10	12	12	10	10	10	9	10	10	7	8	9	9	8	8	8	10	9	11
RD11:	13	11	12	12	10	10	11	9	10	11	8	9	10	9	9	8	8	10	9	10
LS09:	83	60	74	64	47	39	60	41	46	50	26	28	36	30	20	27	35	43	39	53
LS11:	80	50	69	59	36	37	43	33	41	49	24	23	29	28	26	18	23	37	40	49
Grade Context:	1	1	1	1	2	2	1	2	2	2	3	3	2	3	3	2	3	3	2	1
Ability Context:	1	2	2	2	3	3	3	3	3	3	4	4	4	4	4	4	4	4	3	3

*In eleventh grade, College Preparatory and General social studies courses consisted of United States history; "AP" designates the advanced placement or college level section of U.S. history and "ML" represents a course called Modern Living which treats the relationship between society and the individual and in which enrollment is limited to boys only.

APPENDIX B.20 PROFILES OF CLASSROOM GROUPS: TWELFTH GRADE SOCIAL STUDIES

Class of 1969:

Code:*	AP 401	CP 411	CP 412	CP 413	CP 421	CP 422	CP 423	CP 424	CP 425	CP 426	GEN 431	GEN 432	GEN 433	GEN 434	GEN 435	GEN 436	BUS 461	BUS 462
SOCGR12:																		
A:	7	4	10	5	-	-	2	6	6	1	1	-	3	2	-	1	-	
B:	12	22	11	7	1	10	7	11	10	3	2	1	4	13	2	3	4	
C:	4	4	9	8	2	14	5	9	11	2	5	7	18	14	10	4	6	
D:	-	1	2	2	14	5	7	2	3	6	11	15	2	1	11	4	6	
E:	-	-	1	-	4	-	8	3	1	12	6	4	1	-	2	4	6	
	(23)	(31)	(33)	(22)	(21)	(29)	(29)	(31)	(31)	(24)	(25)	(27)	(28)	(30)	(25)	(16)	(22)	
AB11:	9	18	9	11	17	14	15	19	15	23	16	20	25	23	20	21	23	
AB12:	16	24	13	19	21	20	25	23	21	32	37	32	38	34	33	26	32	
RD10:	13	11	12	12	9	10	10	10	10	8	8	8	8	8	8	10	9	
LS11:	83	59	68	64	35	39	45	41	33	21	23	27	21	21	25	37	26	
MS11:	79	49	53	52	29	42	41	37	34	15	22	20	16	22	20	32	31	
Grade Context:	1	1	1	1	3	1	3	1	1	3	3	3	2	1	3	3	3	
Ability Context:	1	2	2	2	4	3	3	3	4	5	5	5	5	5	5	4	4	

Class of 1970:

Code:*	AP 401	CP 411	CP 412	CP 413	CP 421	CP 422	CP 423	CP 424	CP 425	CP 426	GEN 431	GEN 432	GEN 433	GEN 434	GEN 435	GEN 436	GEN 437	GEN 438
SOCGR12:																		
A:	5	9	2	15	1	-	4	1	1	3	1	-	2	-	2	1	6	-
B:	5	4	3	11	2	5	7	3	8	2	2	8	5	4	3	7	1	2
C:	5	12	18	8	8	12	12	8	8	5	6	9	10	9	6	6	7	3
D:	-	1	-	-	14	7	1	11	5	7	9	4	6	6	11	2	4	3
E:	-	-	-	-	-	-	4	4	4	5	6	4	-	2	1	3	7	4
	(15)	(26)	(23)	(34)	(25)	(24)	(28)	(27)	(26)	(22)	(24)	(25)	(23)	(21)	(23)	(19)	(25)	(12)
AB11:	10	13	15	14	19	18	27	18	17	21	22	27	28	31	30	35	29	34
AB12:	16	24	24	22	26	26	37	25	32	39	52	44	49	40	40	57	44	55
RD11:	14	12	10	12	10	10	10	10	10	10	9	9	9	8	9	9	9	9
LS11:	87	60	47	64	38	44	43	35	41	45	26	28	22	20	28	25	31	23
MS11:	67	46	38	47	38	33	32	25	38	36	17	24	25	15	27	17	26	26
Grade Context:	1	1	2	1	3	2	1	3	2	3	3	2	2	2	3	1	2	3
Ability Context:	1	2	3	2	3	3	3	3	3	3	4	4	4	5	4	4	4	4

*All twelfth grade social studies courses are labeled United States History II; they focus on social, economic, and political problems current in America. "AP" designates the advanced placement or college level section of this course.

APPENDIX C

RELATIONSHIP BETWEEN ABILITY PLACEMENT IN ENGLISH AND ABILITY PLACEMENT IN OTHER MAJOR SUBJECT AREAS

Table C.1 ABILITY PLACEMENT IN OTHER MAJOR SUBJECT AREAS BY ABILITY CONTEXT IN ENGLISH AND SCHOOL CLASS IN NINTH GRADE

	Class of 1969:					Class of 1970:				
ENGLISH CONTEXT:	1	2	3	4	5	1	2	3	4	5
LANGUAGE CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	-	80	26	07	-	44	41	21	04	01
3:	-	09	35	14	06	50	46	53	45	24
4:	-	04	17	15	06	-	05	04	14	13
5:	-	-	-	-	-	-	-	-	-	-
Other:	-	01	02	03	-	-	-	-	-	-
None:	-	06 / 100%	20 / 100%	61 / 100%	89 / 101%	06 / 100%	08 / 100%	22 / 100%	37 / 100%	62 / 100%
		(120)	(168)	(197)	(35)	(18)	(39)	(184)	(148)	(103)
MATH CONTEXT:										
1:	-	-	-	-	-	22	18	04	01	-
2:	-	71	14	03	-	61	33	25	12	02
3:	-	21	49	18	03	17	38	47	41	20
4:	-	04	13	22	09	-	-	-	-	-
5:	-	-	02	17	63	-	-	06	18	40
Other:	-	-	-	-	-	-	-	-	01	-
None:	-	04 / 100%	23 / 101%	41 / 101%	26 / 101%	- / 100%	10 / 99%	18 / 100%	28 / 101%	38 / 100%
SCIENCE CONTEXT:										
1:	-	32	09	01	-	-	-	-	-	-
2:	-	29	27	09	03	50	56	33	22	08
3:	-	03	13	10	-	06	10	27	37	40
4:	-	08	33	66	40	-	-	07	09	20
5:	-	-	-	-	51	-	-	-	-	15
Other:	-	-	-	-	-	-	-	03	03	03
None:	-	28 / 100%	19 / 101%	14 / 100%	06 / 100%	44 / 100%	33 / 99%	31 / 101%	28 / 99%	15 / 101%
SOCIAL STUDIES CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	-	23	10	03	-	44	41	32	24	09
3:	-	14	10	05	-	-	-	-	-	-
4:	-	01	02	20	03	-	03	03	07	07
5:	-	-	-	-	51	-	-	-	-	15
Other:	-	01	-	04	03	-	-	02	05	-
None:	-	62 / 101%	77 / 99%	69 / 101%	43 / 100%	56 / 100%	56 / 100%	64 / 101%	64 / 100%	70 / 101%

APPENDIX C (cont.)

Table C.2 ABILITY PLACEMENT IN OTHER MAJOR SUBJECT AREAS BY ABILITY CONTEXT IN ENGLISH AND SCHOOL CLASS IN TENTH GRADE

	Class of 1969:					Class of 1970:				
ENGLISH CONTEXT:	1	2	3	4	5	1	2	3	4	5
LANGUAGE CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	83	49	21	02	-	51	22	10	07	-
3:	14	37	27	07	04	27	35	21	11	02
4:	-	01	09	05	-	06	16	15	09	02
5:	-	-	-	-	-	-	-	-	-	-
Other:	02	13	16	07	02	14	19	21	12	05
None:	02	01	26	79	94	02	08	32	63	91
	101%	101%	99%	100%	100%	100%	100%	99%	101%	100%
	(59)	(104)	(155)	(91)	(48)	(63)	(91)	(154)	(92)	(57)
MATH CONTEXT:										
1:	25	03	01	-	-	41	08	03	-	-
2:	49	29	07	-	-	24	17	03	-	-
3:	20	60	32	-	-	27	60	36	15	-
4:	-	01	07	02	-	-	-	-	-	-
5:	-	-	05	09	33	-	-	08	12	39
Other:	05	07	16	10	15	06	13	16	20	12
None:	-	01	33	79	52	02	02	35	53	49
	99%	101%	101%	100%	100%	100%	100%	101%	100%	100%
SCIENCE CONTEXT:										
1:	31	-	01	-	-	19	-	01	-	-
2:	44	75	36	01	-	57	31	06	-	-
3:	07	14	17	-	-	17	60	44	21	-
4:	-	-	15	51	46	-	02	08	14	16
5:	-	-	01	09	35	-	01	11	29	46
Other:	03	01	01	03	02	-	01	06	09	12
None:	15	10	28	36	17	06	04	24	27	25
	100%	100%	99%	100%	100%	99%	99%	100%	100%	99%
SOCIAL STUDIES CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	-	-	-	-	-	-	-	-	-	-
3:	-	-	-	-	-	-	-	-	-	-
4:	-	-	08	15	13	-	-	-	-	-
5:	-	-	06	32	54	-	-	13	28	53
Other:	-	05	06	-	02	13	14	09	05	02
None:	100	95	80	53	31	87	86	79	66	46
	100%	100%	100%	100%	100%	100%	100%	100%	99%	101%

APPENDIX C (cont.)

Table C.3 ABILITY PLACEMENT IN OTHER MAJOR SUBJECT AREAS BY ABILITY CONTEXT IN ENGLISH AND SCHOOL CLASS IN ELEVENTH GRADE

	Class of 1960:					Class of 1970:				
ENGLISH CONTEXT:	1	2	3	4	5	1	2	3	4	5
LANGUAGE CONTEXT:										
1:	15	03	-	-	-	-	-	-	-	-
2:	22	07	02	01	-	20	03	-	07	-
3:	11	18	06	01	-	27	17	15	11	01
4:	02	-	02	-	-	-	-	-	-	-
5:	-	-	-	-	-	-	-	-	-	-
Other:	22	38	28	10	-	27	35	23	44	02
None:	29	33	62	88	-	27	45	62	39	97
	101%	99%	100%	100%		101%	100%	100%	101%	100%
	(65)	(114)	(138)	(98)		(30)	(116)	(141)	(46)	(107)
MATH CONTEXT:										
1:	09	03	-	-	-	40	07	02	-	-
2:	49	12	01	-	-	43	24	09	04	-
3:	31	49	17	01	-	07	46	21	48	-
4:	02	05	04	-	-	03	02	05	04	-
5:	-	-	01	03	-	-	01	04	04	25
Other:	03	24	27	26	-	-	15	18	35	09
None:	06	07	50	70	-	07	06	42	04	65
	100%	100%	100%	100%		100%	101%	101%	99%	99%
SCIENCE CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	45	15	03	-	-	30	38	09	11	-
3:	05	10	05	-	-	-	07	02	07	-
4:	-	01	01	04	-	-	02	01	11	04
5:	-	-	-	-	-	-	-	-	-	-
Other:	03	16	07	05	-	-	06	07	20	03
None:	48	59	84	91	-	70	47	82	52	94
	101%	101%	100%	100%		100%	100%	101%	101%	101%
SOCIAL STUDIES CONTEXT:										
1:	32	02	-	-	-	53	03	01	-	-
2:	62	36	04	-	-	47	45	09	09	-
3:	05	51	42	05	-	-	44	50	78	10
4:	-	-	42	87	-	-	03	38	02	86
5:	-	-	-	-	-	-	-	-	-	-
Other:	02	04	07	-	-	-	05	03	09	03
None:	-	07	05	08	-	-	-	01	02	01
	101%	100%	100%	100%		100%	100%	102%	100%	100%

APPENDIX C (cont.)

Table C.4 ABILITY PLACEMENT IN OTHER MAJOR SUBJECT AREAS BY ABILITY CONTEXT IN ENGLISH AND SCHOOL CLASS IN TWELFTH GRADE

	Class of 1969:					Class of 1970:				
ENGLISH CONTEXT:	1	2	3	4	5	1	2	3	4	5
LANGUAGE CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	11	02	-	-	-	-	06	03	01	01
3:	07	08	04	-	-	04	12	05	01	-
4:	-	01	02	01	01	-	03	01	03	-
5:	-	-	-	-	-	-	-	-	-	-
Other:	26	25	26	02	03	38	15	17	10	04
None:	56	65	68	97	96	58	65	74	86	95
	100%	101%	100%	100%	100%	100%	101%	100%	101%	100%
	(54)	(118)	(103)	(87)	(114)	(24)	(34)	(101)	(197)	(103)
MATH CONTEXT:										
1:	17	01	-	-	-	58	26	03	-	-
2:	46	27	07	-	-	-	-	-	-	-
3:	02	19	15	01	01	08	26	28	11	01
4:	06	13	33	16	12	-	-	02	04	01
5:	-	01	03	31	46	-	-	05	16	32
Other:	04	08	13	11	11	13	15	31	31	25
None:	26	31	30	40	30	21	32	32	39	41
	101%	100%	101%	99%	100%	100%	99%	101%	101%	100%
SCIENCE CONTEXT:										
1:	-	-	-	-	-	-	-	-	-	-
2:	78	43	24	02	-	63	35	12	06	-
3:	07	28	27	-	-	21	47	49	25	02
4:	-	03	03	-	09	-	-	03	03	06
5:	-	-	-	-	-	-	-	-	-	-
Other:	02	06	06	-	04	13	06	09	06	06
None:	13	20	40	98	87	04	12	28	60	86
	100%	100%	100%	100%	100%	101%	100%	101%	100%	100%
SOCIAL STUDIES CONTEXT:										
1:	41	-	01	-	-	58	-	01	-	-
2:	37	30	07	02	-	25	77	22	02	-
3:	19	53	33	07	-	13	21	57	46	05
4:	02	11	51	28	01	-	-	11	39	69
5:	-	02	05	56	94	-	-	01	04	13
Other:	02	03	02	06	04	04	03	08	06	13
None:	-	03	01	01	02	-	-	-	04	01
	101%	102%	100%	100%	101%	100%	101%	100%	101%	101%

APPENDIX D

REPLICATION OF CHAPTER SIX TABULAR ANALYSES UTILIZING A SAMPLE LIMITED TO STUDENTS WITH JUNIOR HIGH SCHOOL I.Q. SCORES

(Note: The purpose of this appendix is to validate the I.Q. control utilized in Chapter Six. Tables D.1 to D.8 are matched to Tables 6.1 to 6.8 in all respects but the elimination of students without I.Q. scores.)

Table D.1 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT IN NINTH GRADE ENGLISH

ABILITY CONTEXT:	High								Low	
	1		2		3		4		5	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	(8)	(4)	77%	65%	47%	41%	24%	20%	24%	35%
Neutral:	-	(1)	14%	19%	39%	32%	42%	36%	50%	35%
Renegade:	-	(1)	4%	12%	6%	18%	22%	34%	24%	19%
PreSenior:	-	-	5%	4%	8%	8%	12%	10%	2%	10%
	(8)	(6)	(79)	(26)	(142)	(71)	(114)	(91)	(46)	(31)
Mean Junior High School I.Q.:	125	124	114	112	104	105	96	94	89	87

Table D.2 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND GRADING CONTEXT IN NINTH GRADE ENGLISH

GRADING CONTEXT:	High				Low	
	1		2		3	
SOCIAL STATUS:	High	Low	High	Low	High	Low
Identifier:	64%	40%	48%	33%	27%	35%
Neutral:	21%	25%	36%	34%	45%	35%
Renegade:	9%	27%	10%	24%	17%	23%
PreSenior:	6%	8%	7%	9%	10%	8%
	(101)	(48)	(149)	(76)	(139)	(101)
Mean Junior High School I.Q.:	109	101	102	102	99	96

Table D.3 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND LETTER GRADE IN NINTH GRADE ENGLISH

LETTER GRADE:	A		B		C		D		E	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	65%	(1)	69%	65%	43%	46%	21%	17%	13%	21%
Neutral:	29%	-	21%	26%	36%	27%	49%	45%	29%	21%
Renegade:	-	-	5%	6%	10%	24%	20%	31%	32%	25%
PreSenior:	6%	-	5%	3%	5%	4%	9%	7%	26%	32%
	(17)	(1)	(84)	(34)	(168)	(79)	(89)	(83)	(31)	(28)
Mean Junior High School I.Q.:	112	*	107	105	102	100	100	98	97	96

*Mean I.Q. scores are not reported on fewer than five subjects.

APPENDIX D (cont.)

Table D.4 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT IN NINTH GRADE ENGLISH

ABILITY CONTEXT:	High				Low			
GRADING CONTEXT:	High		Low		High		Low	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low
Identifier:	67%	43%	38%	58%	29%	26%	18%	22%
Neutral:	22%	30%	46%	25%	44%	32%	45%	40%
Renegade:	5%	18%	5%	14%	18%	33%	28%	28%
PreSenior:	5%	9%	11%	3%	10%	9%	9%	11%
	(166)	(67)	(63)	(36)	(84)	(57)	(76)	(65)
Mean Junior High School I.Q.:	110	109	106	106	94	92	94	91
	χ^2=14.4 df=2 p<.001				χ^2=4.8 df=2 p<.10			

Table D.5 LETTER GRADE IN NINTH GRADE ENGLISH BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT

ABILITY CONTEXT:	High				Low			
GRADING CONTEXT:	High		Low		High		Low	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low
A:	4%	-	2%	-	10%	2%	1%	-
B:	25%	18%	13%	19%	31%	23%	11%	3%
C:	47%	39%	35%	28%	45%	37%	39%	34%
D:	20%	34%	35%	44%	12%	32%	32%	40%
E:	4%	9%	16%	8%	2%	7%	17%	23%
	(166)	(67)	(63)	(36)	(84)	(57)	(76)	(65)
Mean Junior High School I.Q.:	110	109	106	106	94	92	94	91
	χ^2=9.5 df=2 p<.01				χ^2=11.5 df=2 p<.005		χ^2=5.1 df=2 p<.10	

Table D.6 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH

ABILITY CONTEXT:	High						Low					
LETTER GRADE:	AB		C		DE		AB		C		DE	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	90%	84%	63%	58%	30%	27%	40%	44%	28%	35%	4%	11%
Neutral:	7%	11%	30%	28%	45%	35%	44%	44%	46%	26%	43%	41%
Renegade:	-	5%	3%	8%	13%	27%	9%	6%	19%	37%	39%	32%
PreSenior:	3%	-	4%	6%	13%	10%	7%	6%	7%	2%	14%	16%
	(58)	(19)	(100)	(36)	(71)	(48)	(43)	(16)	(68)	(43)	(49)	(63)
Mean Junior High I.Q.:	114	111	107	109	104	107	99	96	92	93	91	90

APPENDIX D (cont.)

Table D.7 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND GRADING CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH

GRADING CONTEXT:	High						Low					
LETTER GRADE:	AB		C		DE		AB		C		DE	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	71%	62%	52%	47%	33%	12%	56%	(7)	42%	44%	9%	23%
Neutral:	20%	27%	34%	30%	33%	33%	33%	(2)	40%	22%	52%	43%
Renegade:	4%	8%	9%	19%	22%	39%	6%	-	12%	31%	25%	22%
PreSenior:	5%	4%	5%	4%	12%	16%	6%	-	6%	3%	14%	12%
	(83)	(26)	(116)	(47)	(51)	(51)	(18)	(9)	(52)	(32)	(69)	(60)
Mean Junior High I.Q.:	109	104	102	102	102	100	105	103	99	98	97	95
	χ^2=1.0 df=1 p<.10		χ^2=3.6 df=2 p<.10		χ^2=7.9 df=2 p<.025				χ^2=6.0 df=2 p<.10			

Table D.8 ACADEMIC IDENTIFICATION BY SOCIAL STATUS AND ABILITY CONTEXT AND GRADING CONTEXT AND LETTER GRADE IN NINTH GRADE ENGLISH

ABILITY CONTEXT:	High											
GRADING CONTEXT:	High						Low					
LETTER GRADE:	AB		C		DE		AB		C		DE	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	92%	83%	64%	54%	44%	17%	(7)	(6)	59%	70%	13%	42%
Neutral:	6%	8%	28%	35%	31%	34%	(1)	(1)	36%	10%	63%	37%
Renegade:	-	8%	4%	4%	15%	34%	-	-	-	20%	9%	16%
PreSenior:	2%	-	4%	8%	10%	14%	(1)	-	5%	-	16%	5%
	(49)	(12)	(78)	(26)	(39)	(29)	(9)	(7)	(22)	(10)	(32)	(19)
Mean Junior High I.Q.:	115a	114	108b	109	106c	108	110	107	108	109	103d	104

ABILITY CONTEXT:	Low											
GRADING CONTEXT:	High						Low					
LETTER GRADE:	AB		C		DE		AB		C		DE	
SOCIAL STATUS:	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Identifier:	41%	43%	26%	38%	-	5%	(3)	(1)	30%	32%	5%	15%
Neutral:	41%	43%	47%	24%	42%	32%	(5)	(1)	43%	27%	43%	46%
Renegade:	9%	7%	18%	38%	42%	45%	(1)	-	20%	36%	38%	24%
PreSenior:	9%	7%	8%	-	17%	18%	-	-	7%	5%	14%	15%
	(34)	(14)	(38)	(21)	(12)	(22)	(9)	(2)	(30)	(22)	(37)	(41)
Mean Junior High I.Q.:	99	97	92e	94	89	88	100	*	94	92	92	91

*Mean I.Q. scores are not reported on fewer than five subjects.

a χ^2=1.4 df=1 p<.10 b χ^2=.5 df=1 p<.10 c χ^2=6.1 df=2 p<.05 d χ^2=6.0 df=2 p<.10 e χ^2=4.4 df=2 p<.10

APPENDIX E

1 H.S. '65 (1)
2 '69 (2)
3 Neither '70 (3)

_____ ( )
(last) (first) (middle)

Transurbia School Records Code Sheet — Column #

I.D. # _____ 1-5

Grades attended: 7th 8th 9th 10th 11th 12th 6-11

Transferred into: between grades 7 and 12 _____ 12

El. School: 01 02 03 04 05 13-14
06 07 08 09 10
11 12 13 14 15 OTHER

Jr. High: 1 2 3 4 5 6 15
7 OTHER

Lives with: Father & Mother 1 M. only 2 F. only 3 Other 4 16

Father's Ed.: Elem only 1 Some H.S. 2 H.S. Grad 3 College 4 17

Father's Occup.: Unemployed 1 Unskilled 2 Skilled 3
White Collar 4 Professional 5 18

Reason Left: Graduated Private School Moved Still in School
1 2 3 4
Institution Hospital Pregnant Dropout 19
5 6 7 8

Program: C.P. 1 General 2 Business 3 20

Race: Black 1 White 2 Puerto Rican 3 Other 4 21

Sex: Male 1 Female 2 22

Rank in Graduating Class: (1) 23-24

Sports: Basketball or Football 1 Other 2 None 3 25

Other Activities: Student Gov't or Class Council 1 26
Band or Chorus 2 27
Special Interest Clubs 3 28

Page 2 I.D.# _____ Column #

Discipline Record: Yes 1 29
Psychological: Yes 1 30
Remedial Reading: Yes 1 31

Modal Grades: A B C D E
(circle) 10th: 1 2 3 4 5 32
12th: 1 2 3 4 5 33

Total absences: 10th grade____ 34-35
12th grade____ 36-37

Track: 10th Gr.: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 38-39
Eng.
11th Gr.: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 40-41
Math
12th Gr.: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 42-43
Eng.
12th Gr.: 0 1 2 3 4 5 6 7 8 9 10 11 12 13 44-45
Math

7th Grade Homeroom # _____ (Sch.:)
7th Grade Track: Top 1 Middle 2 Bottom 3 46
Modal Grade (7th Gr.): A 1 B 2 C 3 D 4 E 5 47

Total Absences: 7th Grade____ 48-49

Jr. High Sch. I.Q.: (Lorge Thorndike)_____ 50-52

Otis I.Q. (local grping): 1 2 3 4 5 6 7 8 9 10 11 12 53-54

Jr. High Reading Level ( ) - G.L. (.) = _____ 55-57
(date) ( ) Arith. Level (.) - G.L. (.) = ____ 58-60

Metropolitan 1 Iowa 2 Stanford 3 OTHER 4 61

SCAT Scores:
(Compute percentile average from range, rounding up!!!!)
9th Grade: Language percentile_____ 62-63
Math percentile_____ 64-65
11th Grade: Language percentile_____ 66-67
Math percentile_____ 68-69

I.D.# _____
Column #

Scholastic Aptitude: Verbal _____ 70-72
(CEEB) Math _____ 73-75
(Use highest scores)

College Plans: None 1 Jr. College or 2-yr. Technical 2 76

4-yr. Public College in State 3
4-yr. College (private or out of state) 4

Name of College _____

Coded by _____